10-5410-221-14/1

TM 10-5410-221-14/1

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

SHELTER, EXPANDABLE, MUST
BRUNSWICK CORP. MODEL SE-1
NSN 5410-00-933-9387

This copy is a reprint which includes current pages from Changes 1 through 3.

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1976

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WARNING

Pay particular attention to specific cautions and warnings throughout this manual.

DEATH OR INJURY

May result if personnel fail to observe safety precautions.

Adhesives and solvents are highly flammable; perform work in well ventilated area and away from fire. Do not store adhesives or solvents in or near shelter. Personnel must observe extreme caution to avoid contact with electrical circuits when power source is connected. In case of accident from electrical shock, disconnect power source at once. If power source cannot be disconnected, free victim from live conductor with a board or other nonconductor. If victim is unconscious, apply artificial respiration and obtain medical help.

In the event of fluorescent lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorus dust that may be dispersed within the fixture. Excessive inhalation of phosphorus dust must be avoided. Do not use lifting equipment with capacity of less than 9,000 pounds (4,050 kg). Do not allow container to swing back and forth when it is suspended. Failure to observe this warning may result in damage to equipment, or severe injury or death to personnel.

Do not use fork lift with capacity of less than 9,000 pounds (4050 kg). Do not allow container to rock excessively on fork lift. Failure to observe this warning may result in damage to equipment, or severe injury or death to personnel. Make sure the carrier and restraining methods are capable of supporting a weight of 9,000 pounds (4,050 kg) minimum.

WARNING

Clean all parts in a well-ventilated area. Avoid inhalation of solvent fumes and prolonged exposure of skin to cleaning solvent. Wash exposed skin thoroughly. Dry cleaning solvent (Fed. Spec. P-D-680) used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100° to 138°F. (38° to 59°C).

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 10 June 1980

Operator's, Organizational, Direct Support and General Support Maintenance Manual

SHELTER, EXPANDABLE, MUST
BRUNSWICK CORP. MODEL SE-1
NSN 5410-00-933-9387

TM 10-5410-221-14/1, 30 September 1976, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Table of Contents	v and vi	v and vi
Chapter 4	4-79 thru 4-82	4-79 thru 4-82.4
Chapter 8	8-5 and 8-6	8-5 and 8-6
	8-9 thru 8-12	8-9 thru 8-12
Index	I-5 and I-6	I-5 and I-6
	FO-17	FO-17

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CHANGE
No. 3

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Operator, Organizational, Direct Support and General Support Maintenance Manual

SHELTER, EXPANDABLE, MUST BRUNSWICK CORP. MODEL SE-1 NSN 5410-00-933-9387

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B-3 and B-4	B-3 and B-4
C-1 and C-2	C-1 and C-2

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CHANGE

NO. 1

HEADQUARTERS
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OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

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OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

SHELTER, EXPANDABLE, MUST
BRUNSWICK CORP. MODEL SE-1
NSN 5410-00-933-9387

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in operating and maintaining the Expandable Shelter, Brunswick Model SE-1.

1-2. Maintenance Forms and Records

a. DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

b. DA Form 2407 (Maintenance Request used for requesting Support Maintenance).

c. DA Form 2407-1 (Continuation Sheet used for requesting Support Maintenance).

d. DA Form 2408-9 (Equipment Control Record).

e. DA Form 2408-14 (Uncorrected Fault Record).

f. For further information refer to DA Pam 738-750 (The Army Maintenance Management System).

1-3. Equipment Serviceability Criteria (ESC)

This equipment is not covered by an ESC.

1-4. Destruction of Army Materiel to Prevent Enemy Use.

a. Refer to TM 750-244-3 for instructions on the destruction of the expandable shelter to prevent enemy use.

b. In addition to TM 750-244-3, follow instructions below.

(1) *Authority.* The expandable shelter will be destroyed only if it is in danger of being captured and used by the enemy, and only upon the order of the unit commander.

(2) *Method.*

(a) Destroy the same parts on all similar equipment to prevent enemy use through cannibalization.

1. Use sledge hammers, axes, crowbars, or any other heavy tools to smash the components.

2. Slash electrical wires, cables, cords, hose and fabric.

3. Remove easily removable assemblies.

4. Punch holes in sump drain.

5. Destroy electrical controls and lights.

6. If a stream is nearby, throw loose parts into the water. Bury or scatter remaining parts.

(b) If demolition explosives are available, charges should be placed in the following areas.

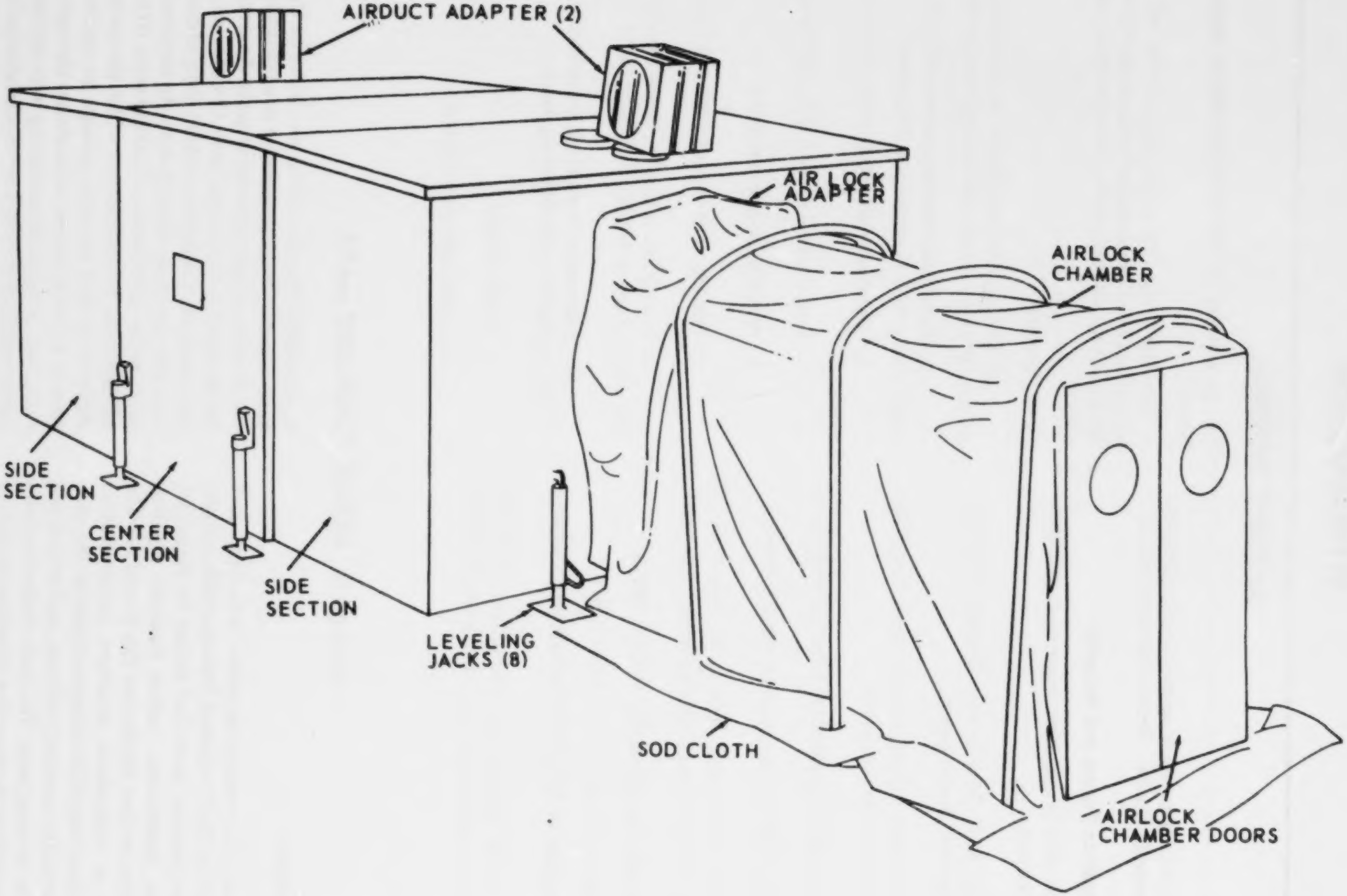
1. Inside shelter.

2. Inside water service box.

Section II. DESCRIPTION AND DATA

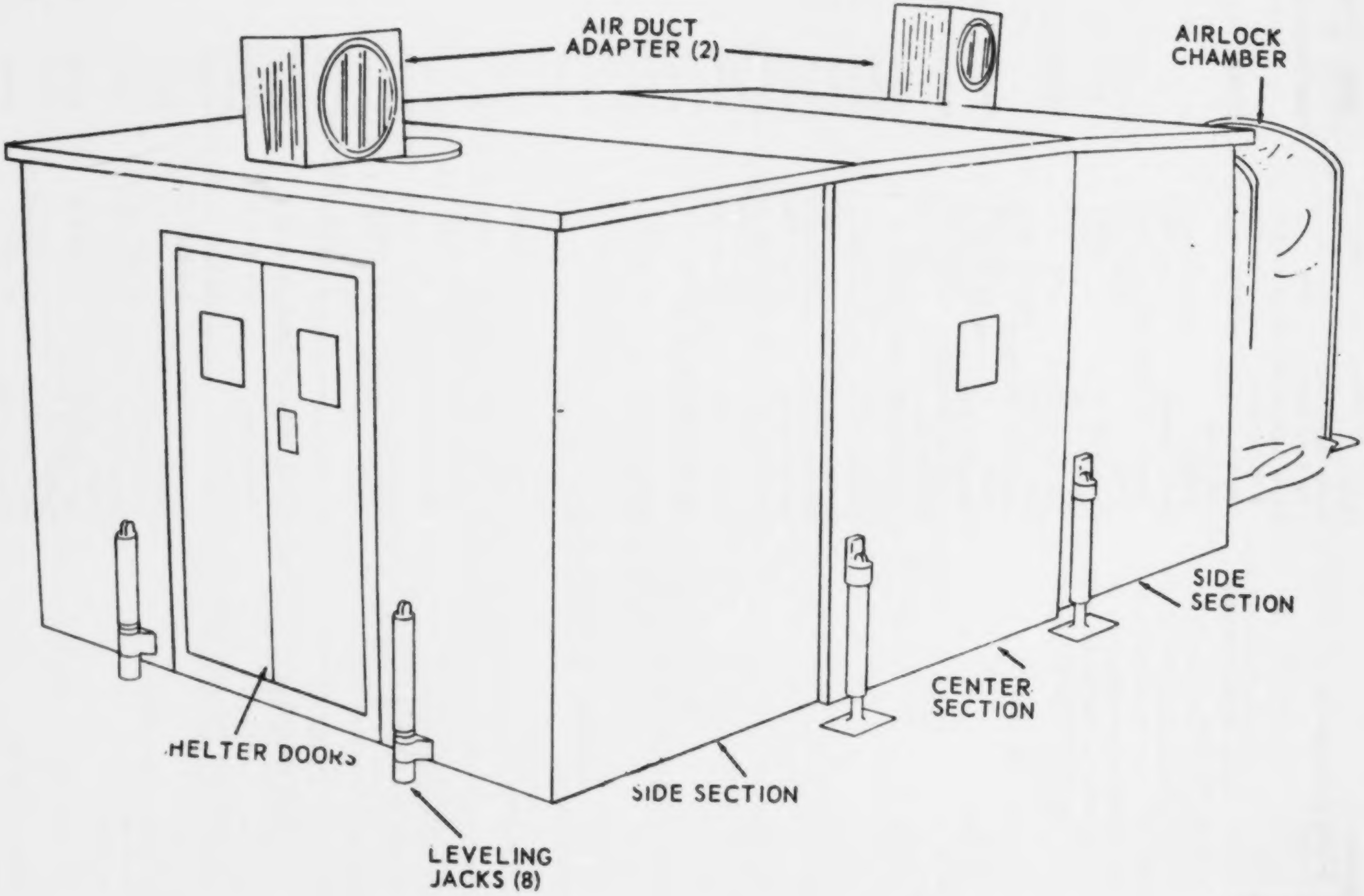
1-5. Description

a. General. The expandable shelter is an element of the Medical Unit Self Contained, Transportable and provides an environment controlled shelter for surgeries, laboratories, pharmacies, central material supplies, X-ray facilities or other similar uses (fig. 1-1 and 1-2). The shelter is an expandable structure constructed of aluminum-faced foam filled honeycomb panels. The shelter is supported by a central skid base, and is equipped with built-in leveling jacks. The basic shelter includes imbedded inserts for the mounting of medical equipment such as surgical lights, intravenous (I.V.) brackets, scrub sinks, sponge racks, X-ray illuminators, a chart holder, etc., when used as an operating room or central material supply (CMS). The shelter has provisions for the attachment of such optional equipment as a humidifier and 24 volt dc power supply for surgical lights. An air lock chamber secured to the shelter over the door provides an entry and exit vestibule to restrict entry of drafts, dust, etc., into the expandable shelter. An electrical system provides for distribution of 120/240 volts, 60 Hertz and 120/208 volts, 400 Hertz power within the shelter. A conditioned air duct provides passage for conditioned air from an external source to the shelter through openings in the roof. A repair kit containing tools and material for minor repairs is provided for expandable shelter. A hot and cold water system and vacuum lines are provided for convenience. The maintenance paragraphs of this manual contain detailed descriptions of all components.


AIRDUCT ADAPTER (2)
AIR LOCK ADAPTER
AIRLOCK CHAMBER
SIDE SECTION
CENTER SECTION
SIDE SECTION
LEVELING JACKS (8)
SOD CLOTH
AIRLOCK CHAMBER DOORS

TS013676

Figure 1-1. Expandable Shelter, Front, Three Quarter View (TS 013676)


AIR DUCT
ADAPTER (2)
AIRLOCK
CHAMBER
SIDE
SECTION
CENTER
SECTION
HELTER DOORS
SIDE SECTION
LEVELING
JACKS (8)

TS013677

Figure 1-2. Expandable Shelter, Rear, Three Quarter View (TS 013677)

b. Tabulated Data.

(1) Expandable Shelter.

Manufacturer	Brunswick Corporation
Part no.	770002
Model no.	SE-1

(2) Electrical System

Voltage and frequency	120/240 volts AC, 60 Hertz 120/208 volts AC, 400 Hertz
Circuit protection	Circuit breakers
Light assemblies	Six 80-watt fluorescent

(3) Plumbing System.

Type	Hot and cold water, vacuum
Flow (water)	1 GPM (min) hot, 3 GPM (min) cold
Suction (vacuum)	3 SCFM (max), 18-20 in. hg

(4) Hose and Cable Assemblies.

(a) Dual Hose, Hot and Cold Water.

Length	6.5 feet (195 cm)

(b) Hose-vacuum.

Length	6 feet (180 cm)

(c) Drain Hose.

Length	6.5 feet (195 cm)

(d) Power Cable, 60 Hertz.

Length	25 feet (750 cm)

(e) Power Cable, 400 Hertz.

Length	25 feet (750 cm)

(f) Air lock Electric Light and Cable Assembly.

Length	25 feet (750 cm)
Light type	50 watt, incandescent

(5) Air Distribution Plenum.

Type	Fabric and metal
Fasteners	Metal hooks

(6) Repair Kit

Components	Core, 1.92 and 2.90 inch thick (4.8768 cm) and (7.366 cm)
	Phenolic, 12 x 2 and 12 x 3 inches (2) (30.48 x 5.08 cm) (30.48 x 7.62 cm)
	Facing, 15 x 15 inches (3) (38.1 x 38.1 cm)
	Facing, 3 x 18 inches (8) (7.62 x 45.72 cm)
	Flooring, Velstat, 2 ft. (60cm) (shelter serial No. 1 thru 184 only)
	Floor refinishing Primer and Rubber Coating (replacement for velstat flooring)
	Seals (6)
	Seal (polyurethane tape)
	Seal (neoprene)
	Seal (silicone)
	Tape, Mylar
	Cloth, emery (6)
	Cup, mixing (12)
	Paddle, mixing (12)
	Rivet, AD42H, AK42H, (200 each)
	Screw (200)
	Riveter, hand
	Nose piece
	Adhesive (1 part and 2 part)
	Bag, cotton

(7) Expandable Packaged Items.

Carton		96940	1 ea.
Equip. Maint. Log-DA Form 2409	GFE	650009	1 ea.
Equip. Acceptance & Registration Record DA Form 2408-8	GFE	650008	1 ea.
Equip. Transfer Report- DA Form 2408-7	GFE	650007	1 ea.
Equip. Daily & Monthly Log-DA Form 2048-1	GFE	650006	2 ea.
Equip. Log Book Assembly- DA Form 2408	GFE	650005	1 ea.
Publication Case-7520-00-559-9618	GFE	650004	1 ea.
Book Binder-GS-00S-90981	GFE	650003	1 ea.
Carton		806056	1 ea.
Bellows	5-4-1650-1	600106	1 ea.
Carton		806057	1 ea.
Tent Pin	MIL-P-501J	600112	8 ea.
Ground Anchor	MIL-A-3962C-A	600113	14 ea.
Bow Spike	5-4-1540-23-13	600104Z	10 ea.
Driving Rod	MIL-A-3962C-R	600119	1 ea.
Holding Handle	MIL-A-3962C-H	600120	1 ea.
Driving Head	MIL-A-3962C-DH	600121	1 ea.
Carton		96940	1 ea.
Light Assembly	5-4-1605-8	600002Z	1 ea.
Carton		806058	1 ea.
Adapter Duct	5-4-2013-34	600029	1 ea.
Carton		806058	1 ea.
Duct Assembly	5-4-2114-92	600030	1 ea.
Carton	1	806059	1 set
60 Hertz Cable	13217E3983	600006	1 ea.
Carton		805059) 806060)	1 set
400 Hertz Cable	13217E3982	600007	1 ea.
Carton		806059 806060)	1 set
Hose, Drain	5-4-2020-62	600008	1 ea.
Carton		806061 806062)	1 set
Vacuum Hose	5-4-2052-23	700139	1 ea.
Carton		806059) 806060)	1 set
Plenum, Air	5-4-2015-35	700582	1 ea.
Carton		806061 806062)	1 set
Dual Water Hose	5-4-2014-52	600031	1 ea.
Carton		806063	1 ea.
Tread Plate-Lower	5-4-2011-31	700571	1 ea.
Tread Plate-Upper	5-4-2011-32	700572	1 ea.
Wooden Carton			1 ea.
Jack Assembly	5-4-2047-26	600118	2 ea.
Carton		96940	1 ea.
Jack, Base Plate	5-4-2047-27-19		4 ea
Strap Assembly	5-4-1661-1	600027	4 ea.
Web Net Assembly	5-4-1662-1	600028	1 ea.
Carton			1 set
Air Lock Assembly-Complete	5-4-1601-1	600110	1 ea.

Carton			1 ea.
Rope Net Assembly	5-4-1663-1	600134	1 ea.

(8) *Dimensions.*

Expanded Shelter:

Length	18 feet 2 inches (554 cm)
Width	12 feet 4 inches (376 cm)
Height	8 feet 2 inches (249 cm)
Floor space	216.075 sq. feet (20.073 sq meter)
Air lock length	12 feet (366 cm)

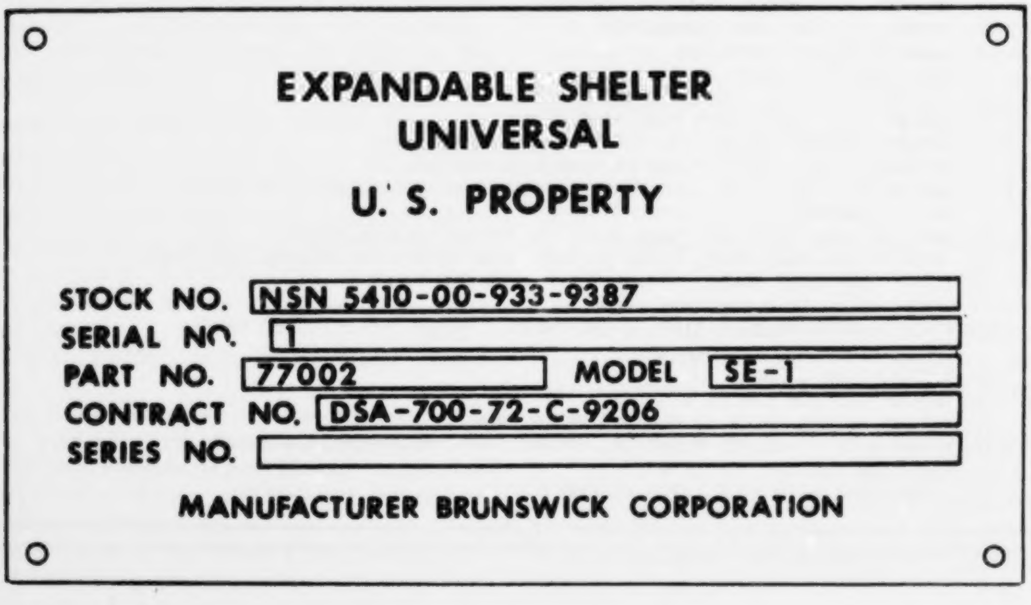
Folded Shelter:

Length	8 feet 2 inches (249 cm)
Width	12 feet 4 inches (376 cm)
Height	8 feet 2 inches (249 cm)
Cube	118,449.33 cubic ft (3,354,130 ccm)

(9) *Expandable Shelter Wiring Diagram*

Schematic Wiring Diagram	Figure FO-1
Pictorial Wiring Diagram	Figure FO-2

c. *Identification.* An identification plate (fig. 1-3) and an instruction plate (fig. 1-4) are attached to the shelter center section. The identification plate gives the manufacturer's data and the instruction plate gives detailed information on the expanding and collapsing of the shelter.



EXPANDABLE SHELTER
UNIVERSAL

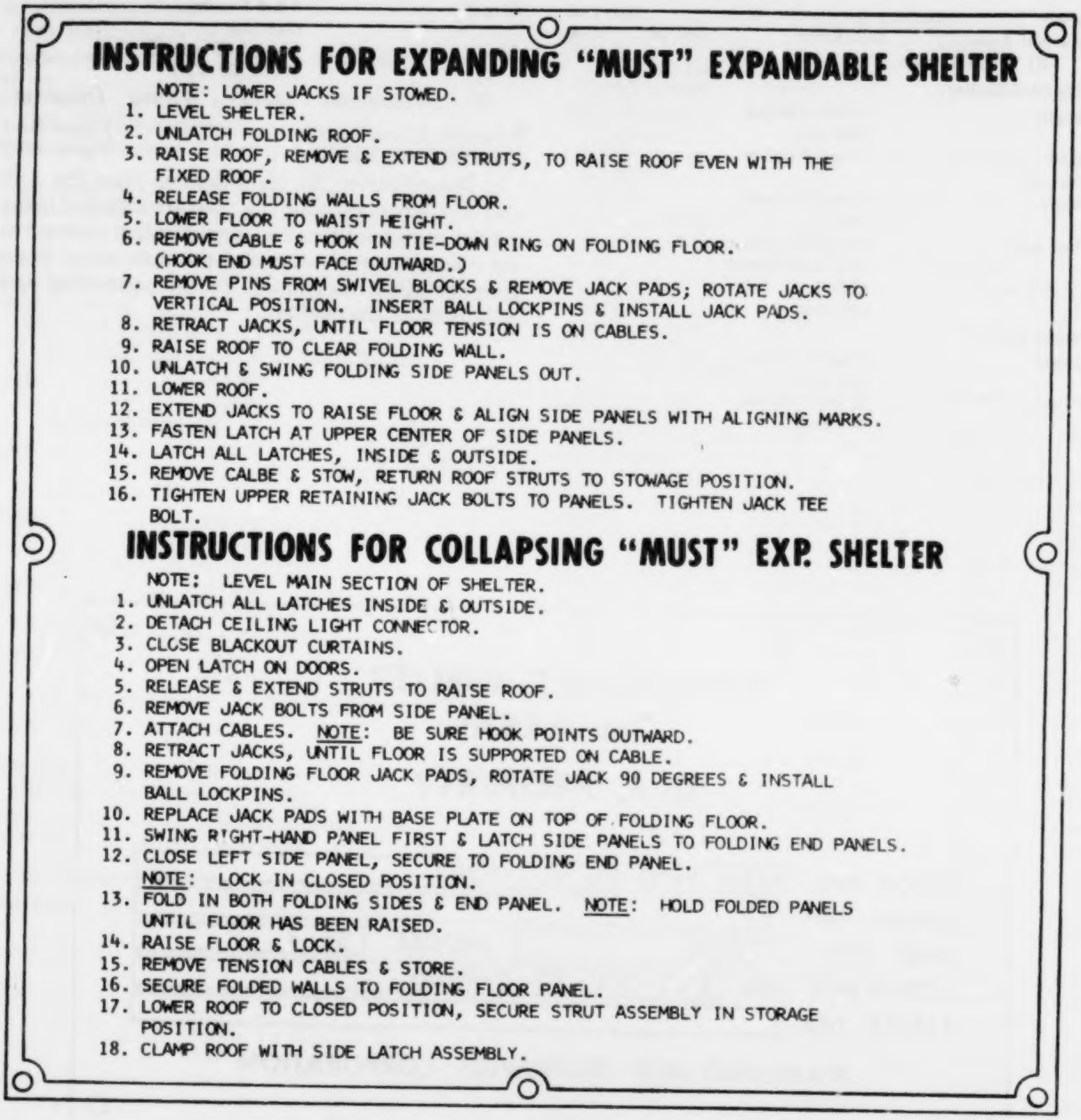
U. S. PROPERTY

STOCK NO. NSN 5410-00-933-9387
SERIAL NO. 1
PART NO. 77002 MODEL SE-1
CONTRACT NO. DSA-700-72-C-9206
SERIES NO.

MANUFACTURER BRUNSWICK CORPORATION

TS013678

Figure 1-3. Identification Plate (TS 013678)



INSTRUCTIONS FOR EXPANDING "MUST" EXPANDABLE SHELTER

NOTE: LOWER JACKS IF STOWED.

1. LEVEL SHELTER.
2. UNLATCH FOLDING ROOF.
3. RAISE ROOF, REMOVE & EXTEND STRUTS, TO RAISE ROOF EVEN WITH THE FIXED ROOF.
4. RELEASE FOLDING WALLS FROM FLOOR.
5. LOWER FLOOR TO WAIST HEIGHT.
6. REMOVE CABLE & HOOK IN TIE-DOWN RING ON FOLDING FLOOR. (HOOK END MUST FACE OUTWARD.)
7. REMOVE PINS FROM SWIVEL BLOCKS & REMOVE JACK PADS; ROTATE JACKS TO VERTICAL POSITION. INSERT BALL LOCKPINS & INSTALL JACK PADS.
8. RETRACT JACKS, UNTIL FLOOR TENSION IS ON CABLES.
9. RAISE ROOF TO CLEAR FOLDING WALL.
10. UNLATCH & SWING FOLDING SIDE PANELS OUT.
11. LOWER ROOF.
12. EXTEND JACKS TO RAISE FLOOR & ALIGN SIDE PANELS WITH ALIGNING MARKS.
13. FASTEN LATCH AT UPPER CENTER OF SIDE PANELS.
14. LATCH ALL LATCHES, INSIDE & OUTSIDE.
15. REMOVE CALBE & STOW, RETURN ROOF STRUTS TO STOWAGE POSITION.
16. TIGHTEN UPPER RETAINING JACK BOLTS TO PANELS. TIGHTEN JACK TEE BOLT.

INSTRUCTIONS FOR COLLAPSING "MUST" EXP. SHELTER

NOTE: LEVEL MAIN SECTION OF SHELTER.

1. UNLATCH ALL LATCHES INSIDE & OUTSIDE.
2. DETACH CEILING LIGHT CONNECTOR.
3. CLOSE BLACKOUT CURTAINS.
4. OPEN LATCH ON DOORS.
5. RELEASE & EXTEND STRUTS TO RAISE ROOF.
6. REMOVE JACK BOLTS FROM SIDE PANEL.
7. ATTACH CABLES. NOTE: BE SURE HOOK POINTS OUTWARD.
8. RETRACT JACKS, UNTIL FLOOR IS SUPPORTED ON CABLE.
9. REMOVE FOLDING FLOOR JACK PADS, ROTATE JACK 90 DEGREES & INSTALL BALL LOCKPINS.
10. REPLACE JACK PADS WITH BASE PLATE ON TOP OF FOLDING FLOOR.
11. SWING RIGHT-HAND PANEL FIRST & LATCH SIDE PANELS TO FOLDING END PANELS.
12. CLOSE LEFT SIDE PANEL, SECURE TO FOLDING END PANEL. NOTE: LOCK IN CLOSED POSITION.
13. FOLD IN BOTH FOLDING SIDES & END PANEL. NOTE: HOLD FOLDED PANELS UNTIL FLOOR HAS BEEN RAISED.
14. RAISE FLOOR & LOCK.
15. REMOVE TENSION CABLES & STORE.
16. SECURE FOLDED WALLS TO FOLDING FLOOR PANEL.
17. LOWER ROOF TO CLOSED POSITION, SECURE STRUT ASSEMBLY IN STORAGE POSITION.
18. CLAMP ROOF WITH SIDE LATCH ASSEMBLY.

TS013679

Figure 1-4. Instruction Plate (TS 013679)

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

WARNING

If equipment fails to operate, refer to troubleshooting procedures in Chapter 3.

2-1. General

This section describes the various controls and utility connections and provides the operator/crew sufficient information to ensure connections and operation of the expandable shelter.

2-2. Controls and Utility Connections

The controls and instruments are illustrated in figures 2-1, 2-2, 2-3, 2-4 and 2-5. The location, description and purpose of each are given in the following paragraphs.

2-3. Power Input Panel

a. General. The power input panel (fig. 2-1) is recessed on the lower outside of the front, center-section wall. The power input panel provides power inlet receptacles for 120/208 volts, 400 Hz; 120/240 volts, 60 Hz power, air lock light, hose heater, remote temperature sensor, telephone jack and drain hose heater.

b. 120/208 Volts, 400 HZ Power Inlet Receptacle.

(1) The inlet receptacle is a five pin snap lock receptacle with a hinged protective cover.

(2) The inlet receptacle provides for connection of a source of 120/208 volts, 400 Hz electrical power to the shelter electrical system.

c. 120/240 Volts, 60 Hz Power Inlet Receptacle.

(1) The inlet receptacle is a five pin snap lock receptacle with a hinged protective cover.

(2) The inlet receptacle provdies for connection of a source of 120/240 volts, 60 Hz electrical power to the shelter electrical system.

d. Air lock Light Receptacle. The air-lock light receptacle provides a source of 120 volts, 400 Hz electrical power for connection of the air lock light assembly.

e. Hose Heater Receptacle. The hose heater receptacle provides a source of 120/208 volts, 400 Hz electrical power for connection of the hose heater.

f. Remote Temperature Sensor Receptacle. The remote temperature sensor receptacle provides for connection of condition air source thermostat to the remove temperature sensor. Used on shelter serial No. 1 thru 184 only.

g. Telephone Jack. The telephone jack provides a connection for an external telephone input line.

h. Drain Hose Heater Receptacle. The drain hose heater receptacle provides a source of 120/208 volts, 400 Hz electrical power for connection of the drain hose heater.

2-4. Power Output Panel

a. General. The power output panel (fig. 2-2) is mounted on the rear center-section wall, adjacent to the shelter access door. The power output panel provides output receptacle for 120/208 volts, 400 Hz power; 120/240 volts, 60 Hz power, air lock light, and emergency surgery light power supply inlet (fig. 2-2).

b. 120/208 Volts, 400 Hz Power Output Receptacle.

(1) The output power receptacle is a five pin snap lock receptacle with a hinged protective cover.

(2) The outlet power receptacle provides for connection of another shelter to the 120/240 volts, 60 Hz electrical circuit.

c. 120/240 Volts, 60 Hz Power Output Receptacle.

(1) The outlet power receptacle is a five pin snap lock receptacle with a hinged protective cover.

(2) The outpower power receptacle provides for connection of another shelter to the 120/240 volts, 60 Hz electircal circuit.

d. Air Lock Light Receptacle. The air lock light receptacle provides a source of 120 volts, 400 Hz

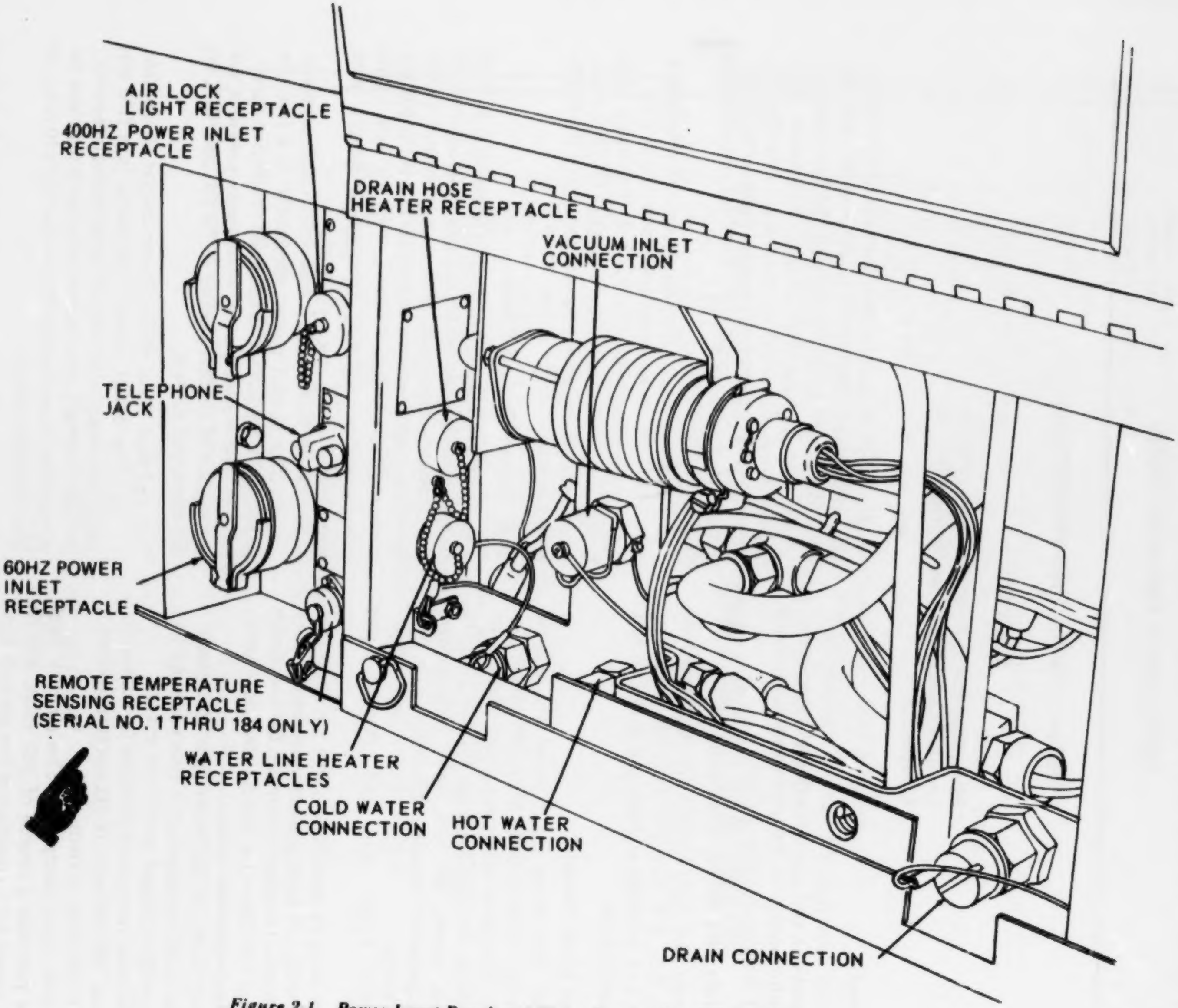

AIR LOCK LIGHT RECEPTACLE
400HZ POWER INLET RECEPTACLE
DRAIN HOSE HEATER RECEPTACLE
VACUUM INLET CONNECTION
TELEPHONE JACK
60HZ POWER INLET RECEPTACLE
REMOTE TEMPERATURE SENSING RECEPTACLE (SERIAL NO. 1 THRU 184 ONLY)
WATER LINE HEATER RECEPTACLES
COLD WATER CONNECTION
HOT WATER CONNECTION
DRAIN CONNECTION

Figure 2-1. Power Input Panel and Water Service Box (TS 013680)

TS013680

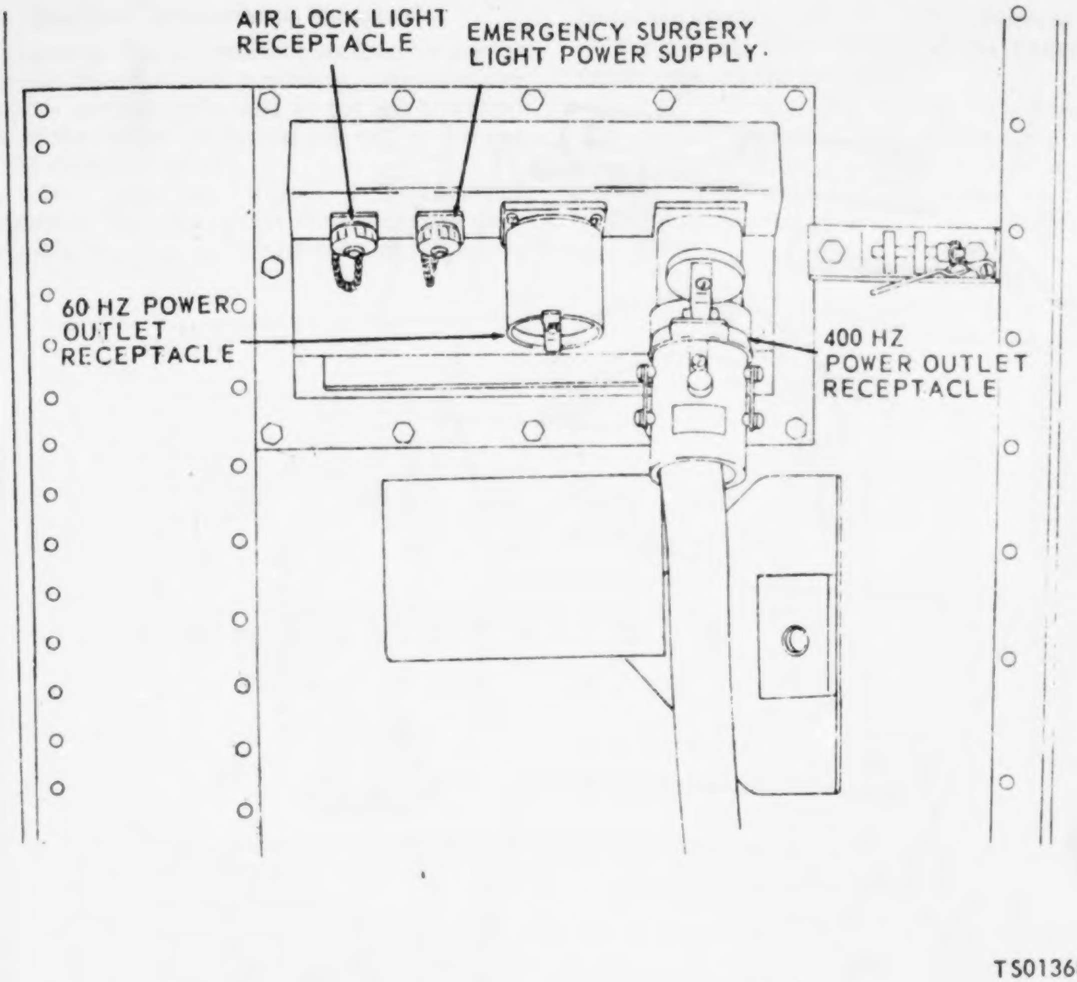

AIR LOCK LIGHT RECEPTACLE
EMERGENCY SURGERY LIGHT POWER SUPPLY
60 HZ POWER OUTLET RECEPTACLE
400 HZ POWER OUTLET RECEPTACLE
TS013681

Figure 2-2. Power Output Panel Assembly (TS 013681)

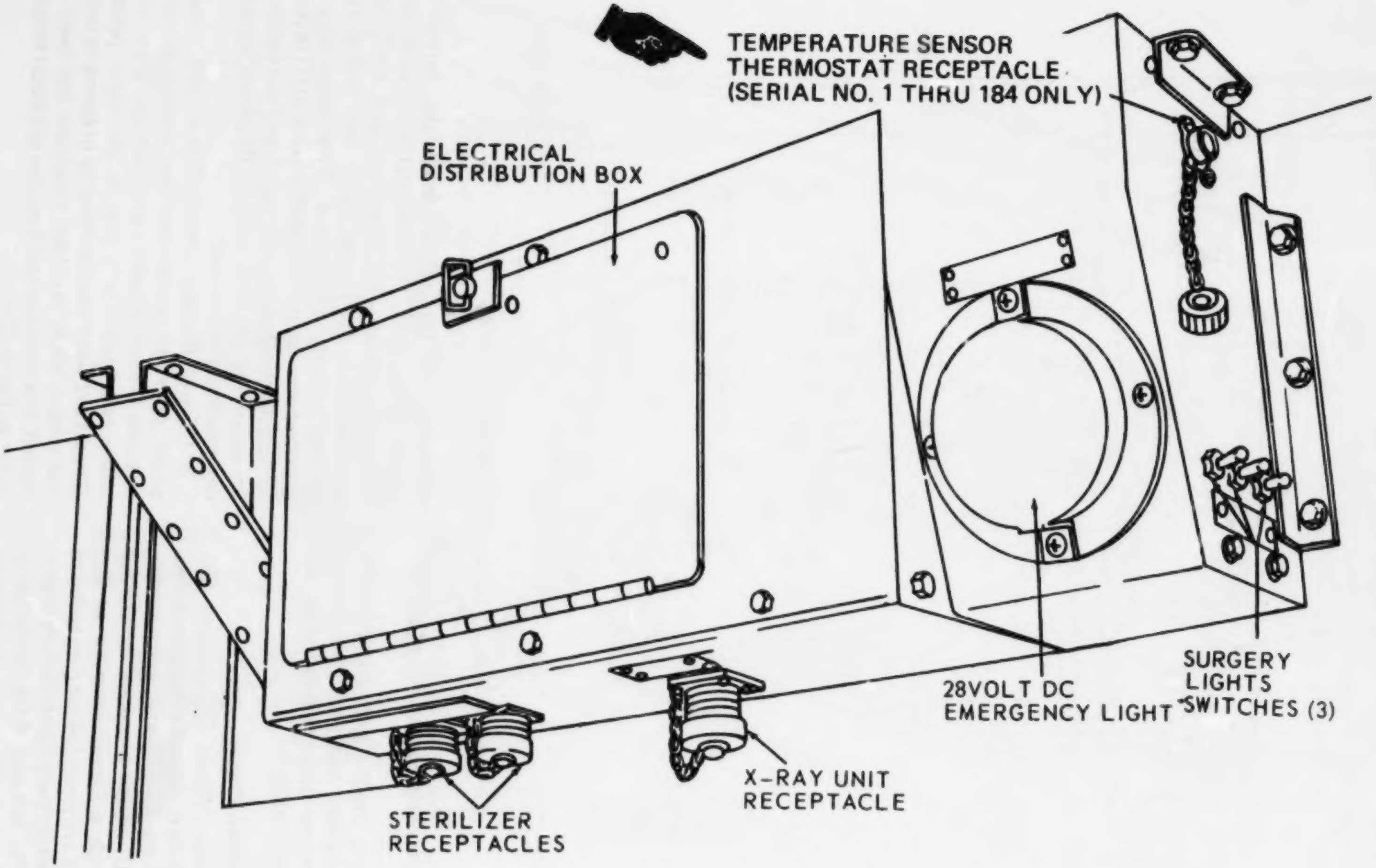
electrical power for alternate connection of the air lock light assembly.

e. Emergency Surgery Light Power Supply Inlet Receptacle. The emergency surgery light power supply inlet receptacle provides a connection for an emergency light power supply.

2-5. Power Distribution Panel

a. Power Distribution Panel. The power distribution panel (fig. 2-3) is located above the access door on the inside of the rear, center section wall. The panel contains all circuit breakers for shelter electrical systems with a hinged door for access. Three toggle switches are provided to operate the 23 volt dc ceiling mounted surgery lights and emergency light when used. The left end of the power panel includes a means for attaching and electrically connecting a humidistat from the humidifier system, when used. The right end of the power panel includes a means for attaching and electrically connecting a thermostat from the temperature control system, when used. Two connectors are provided for supplying 120/208 volts, 400 Hz power for sterilizer cabinets, when used; and one connector for supplying 120/240 volts, 60 Hz power for an X-ray machine, when used.

b. Circuit Breaker Panel. The circuit breaker panel provides protection for shelter electrical circuits. Circuit breakers are push-pull type, which when overloaded will pop to the open position. Circuit breakers may be reset by pressing in to close the circuit after overload condition has been corrected. For location and function of circuit breakers refer to figure 2-3.


TEMPERATURE SENSOR
THERMOSTAT RECEPTACLE
(SERIAL NO. 1 THRU 184 ONLY)
ELECTRICAL
DISTRIBUTION BOX
SURGERY
LIGHTS
SWITCHES (3)
28VOLT DC
EMERGENCY LIGHT
X-RAY UNIT
RECEPTACLE
STERILIZER
RECEPTACLES

A. FRONT VIEW

TS013682

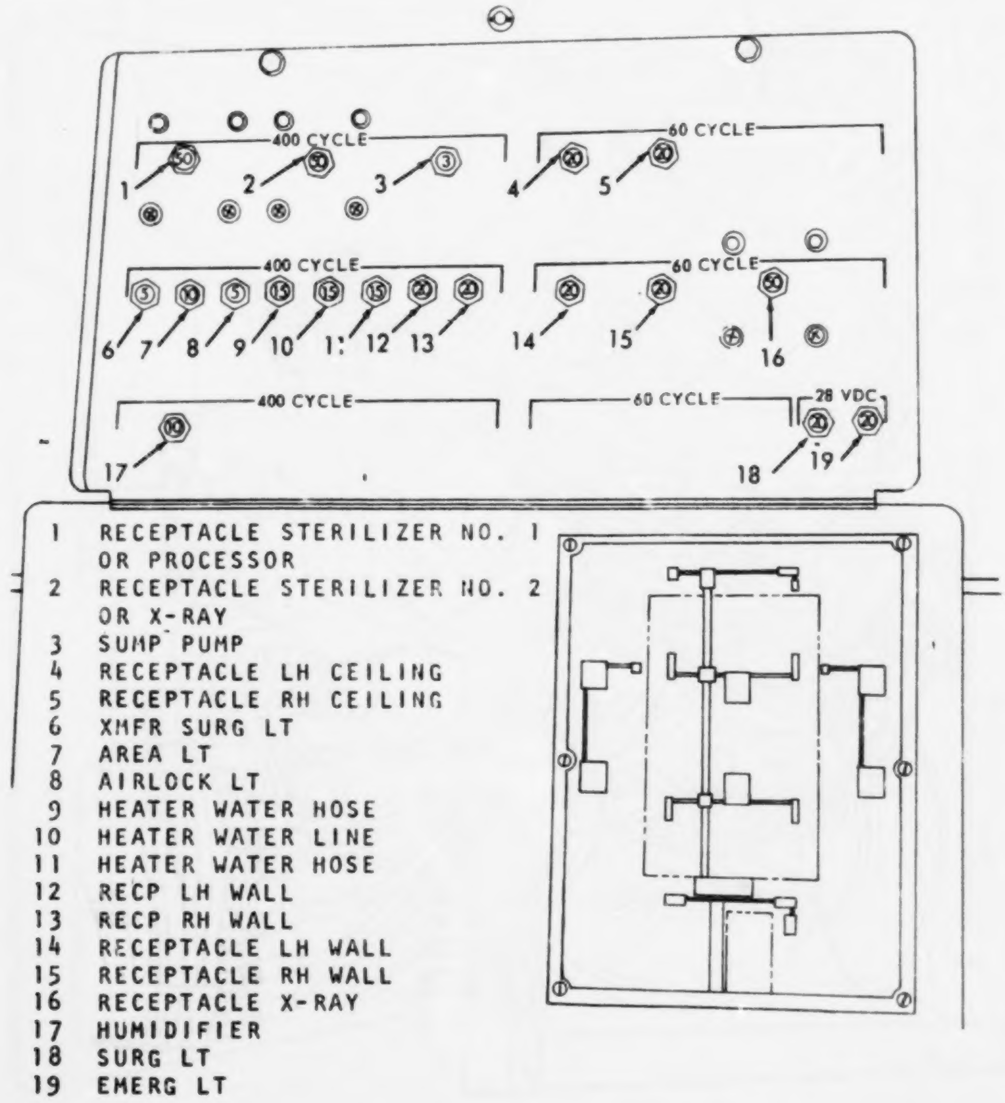
Figure 2-3. Power Distrubution Panel Assembly (Sheet 1 of 3) (TS 013682)

2-6. Electrical Convenience Receptacles

a. General. The convenience receptacles consist of twelve duplex outlets, located at intervals along the left and right walls, and on the left and right sides of the ceiling, providing 120 volt, 60 Hz and 400 Hz electrical power.

b. 120 Volt, 60 Cycle, Convenience Receptacles. The convenience receptacles are standard parallel type twist lock receptacles. Six receptacles are located on the walls of the shelter and four on the ceiling. Each receptacle has voltage and cycles noted on the face plate.

c. 120 Volt, 400 Cycle, Convenience Receptacles. The convenience receptacles are standard parallel type twist lock receptacles. Two receptacles are located on the walls of the shelter. Each receptacle has voltage and cycles noted on the face plate.



1	RECEPTACLE STERILIZER NO. 1 OR PROCESSOR
2	RECEPTACLE STERILIZER NO. 2 OR X-RAY
3	SUMP PUMP
4	RECEPTACLE LH CEILING
5	RECEPTACLE RH CEILING
6	XMFR SURG LT
7	AREA LT
8	AIRLOCK LT
9	HEATER WATER HOSE
10	HEATER WATER LINE
11	HEATER WATER HOSE
12	RECP LH WALL
13	RECP RH WALL
14	RECEPTACLE LH WALL
15	RECEPTACLE RH WALL
16	RECEPTACLE X-RAY
17	HUMIDIFIER
18	SURG LT
19	EMERG LT

TS013683

Figure 2-3. Power Distribution Panel Assembly (Sheet 2 of 3) (TS 013683)

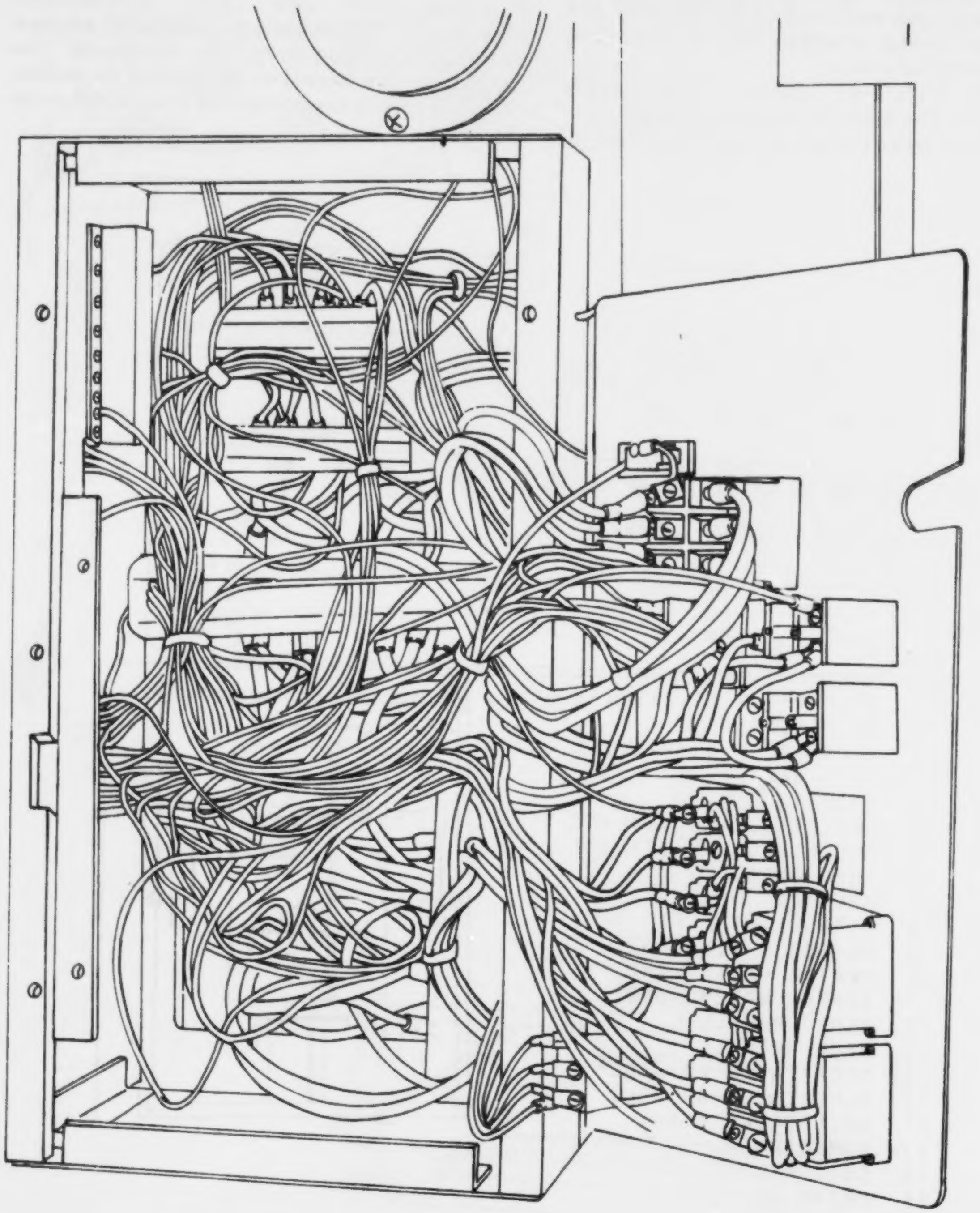
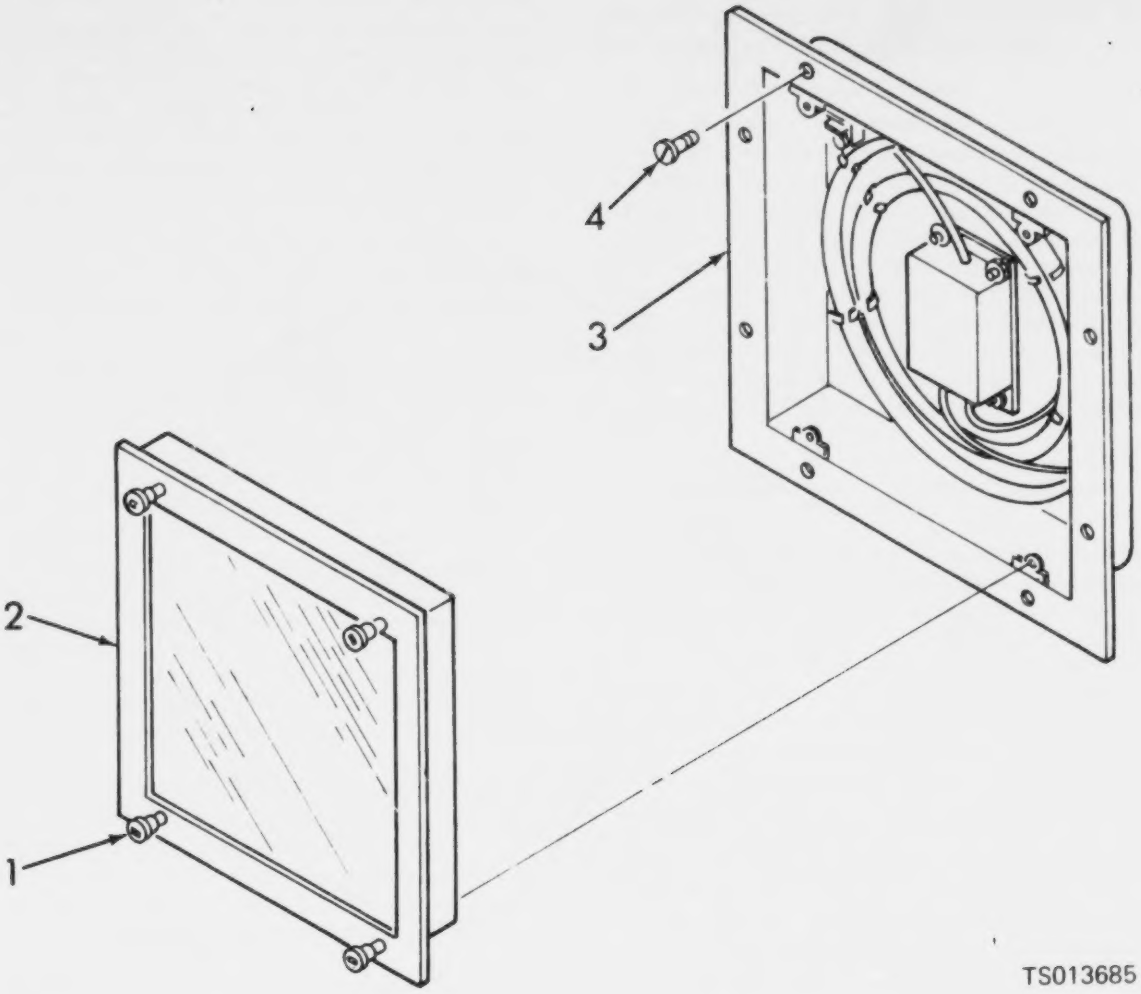
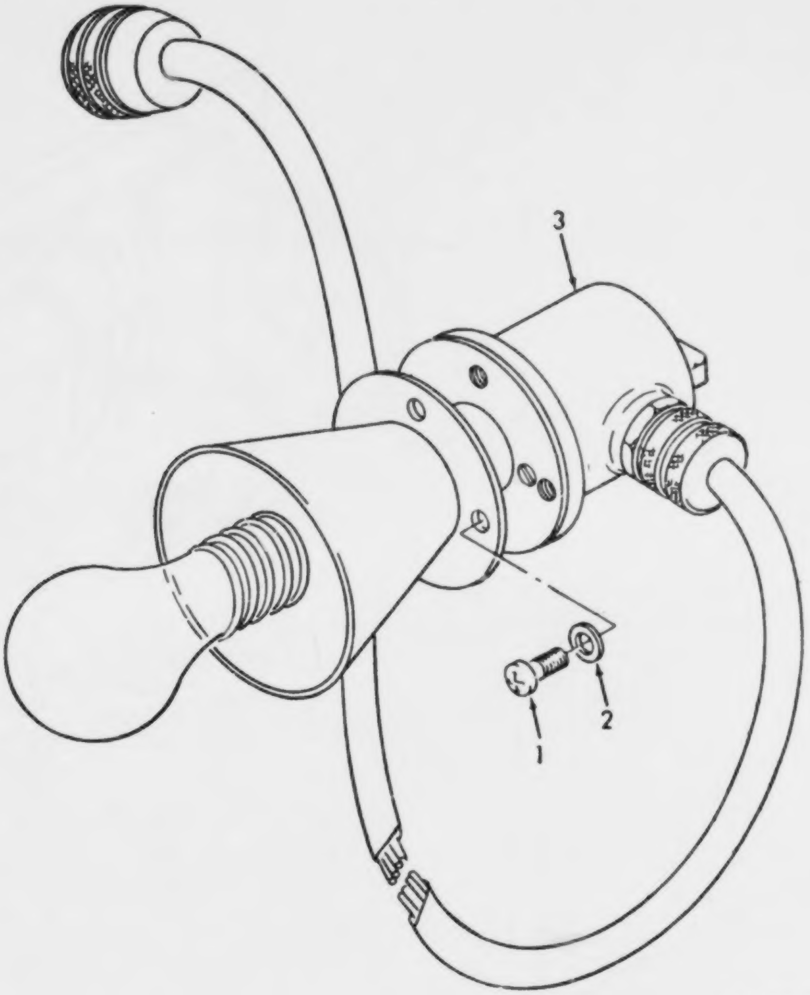


Figure 2-3. Power Distribution Panel Assembly (Sheet 3 of 3) (TS 013684)


4
3
2
1
TS013685

1 Screw 2. Light Assembly 3. Flange Assembly 4.Screw

Figure 2-4. Fluorescent Light Assembly(TS 013685)



TS 013686

1. Screw 2. Washer 3. Light assembly

Figure 2-5. Air Lock Light Assembly (TS 013686)

2-7. Fluorescent Light Assemblies

Two fluorescent light assemblies (fig. 2-4) are provided in the center section ceiling, and two light assemblies in each of the fold-out sections. The light assemblies are flush-mounting, replaceable type, housing one 22-watt and one 32-watt circular fluorescent lamps.

The inter-connecting wiring for the lights are contained in raceways that are separate from other wiring for radio noise filtering purposes. A flexible shielded insulated cable is provided for connecting the fold out ceiling lights across the hinge line.

2-8. Air Lock Light Assembly

The air lock light-cable assembly (fig. 2-5) is a rugged, weatherproof type fixture, accepting a standard-base 50 watt, incandescent lamp. The light operates on 120 volt, 400 Hz power and is connected directly either to the power-input panel or power output panel.

2-9. Water Box Interior Connections and Sump Installation

a. General. The water box interior connections and sump installation (fig. 2-6) is located at the front fixed wall of the shelter and consists of hot and cold water connections, sump, vacuum connection, washer drain, and overboard drain.

b. Hot and Cold Water Connections. The hot and cold water connections contain two capped ports each to facilitate connections of water service equipment.

c. Sump. The sump is secured to the shelter floor in front of the water box and contains connections for sump vent, service equipment drain, and sump drain.

(1) *Sump vent.* The sump vent is located at the top side of the sump and vents the sump to the overboard drain.

(2) *Service equipment drain.* The service equipment drain is located at the top side of the sump. The drain allows waste from service equipment to enter the sump.

(3) *Sump drain.* The sump drain is located on the bottom of the sump and is connected to the sump pump to facilitate draining of waste from service equipment.

d. Vacuum Connection. The vacuum connection is located on the inner face of the water box and facilitates connection and operation of vacuum equipment.

e. Washer Drain. The washer drain is a plugged port located on the inner face of the water box and facilitates draining of washer, when used.

f. Overboard Drain. The overboard drain is located on the top left end of the water box and contains connections for humidifier drain and sump vent.

(1) *Humidifier drain connection.* The humidifier drain connection is a capped port on the overboard drain which is utilized for drainage of the humidifier when used.

(2) *Sump vent connection.* The sump vent connection has a sump vent line connected which facilitates venting of the sump to the overboard drain.

2-10. Water Outlet Panel

a. General. The water outlet panel (fig. 2-7) is located at the bottom rear of the shelter and serves as an interconnection point for additional shelters. The water output panel contains connections for hot and cold water outlet, drain outlet, and hose heater.

b. Hot and Cold Water Outlet Connections. Two outlet connections are furnished for interconnection of shelter water system.

c. Drain Outlet Connection. The drain connection facilitates interconnection of shelter drain systems.

d. Hose Heater Receptacle. The hose heater receptacle is provided as a source of 120 volts, 400 Hz electrical power for outlet hose heater.

2-11. Conditioned Air System

Ducts (fig. 2-8) are installed between a conditioned air source and the expandable shelter roof duct adapter (fig. 2-8) to provide inlet or return air passage for the shelter. Metal flanges at each end of the duct provide for connection by clamping to the shelter and air source or additional ducts may be joined together if required. Air distribution plenums (fig. 2-9) are connected to the metal flange on the interior of the shelter. The air distribution plenum has four sets of air directional vanes, each one adjustable for control of conditioned air into the shelter.

2-12. Operation Under Normal Conditions

a. General.

(1) The instructions in this section are published for the information and guidance of personnel responsible for operation of the expandable shelter.

(2) The operator shall be familiar with the operation of all of the components and fixtures of the expandable shelter. This section provides instructions for operation of the various components and fixtures of the expandable shelter and for coordinating the basic motions to perform the specific functions for which the shelter is designed. Since nearly every job presents a different problem the operator may have to vary given procedures to fit the individual job.

b. Operation fo Components and Fixtures.

(1) *Air lock door.* Operation of' air lock door handles and adjustment of anti-backdraft valves on doors is shown and described in figure 2-10.

(2) *Shelter doors.* Operation of shelter doors is shown and described in figure 2-11.

(3) *Blackout curtains.* Operation of blackout curtains is shown and described in figure 2-12.

(4) *Conditioned air plenums.* Operation of conditioned air plenums is shown and described in figure 2-13.

(5) *Electrical circuit breakers and components.*

(a) The power distribution panel, located above the access door on the inside of the rear center section wall, contains all circuit breakers for shelter electrical systems with a hinged door for access.

(b) Circuit breaker panel. The circuit breaker panel (fig. 2-3) provides protection for shelter electrical circuits. Circuit breakers are push-pull type, which when overloaded will pop to

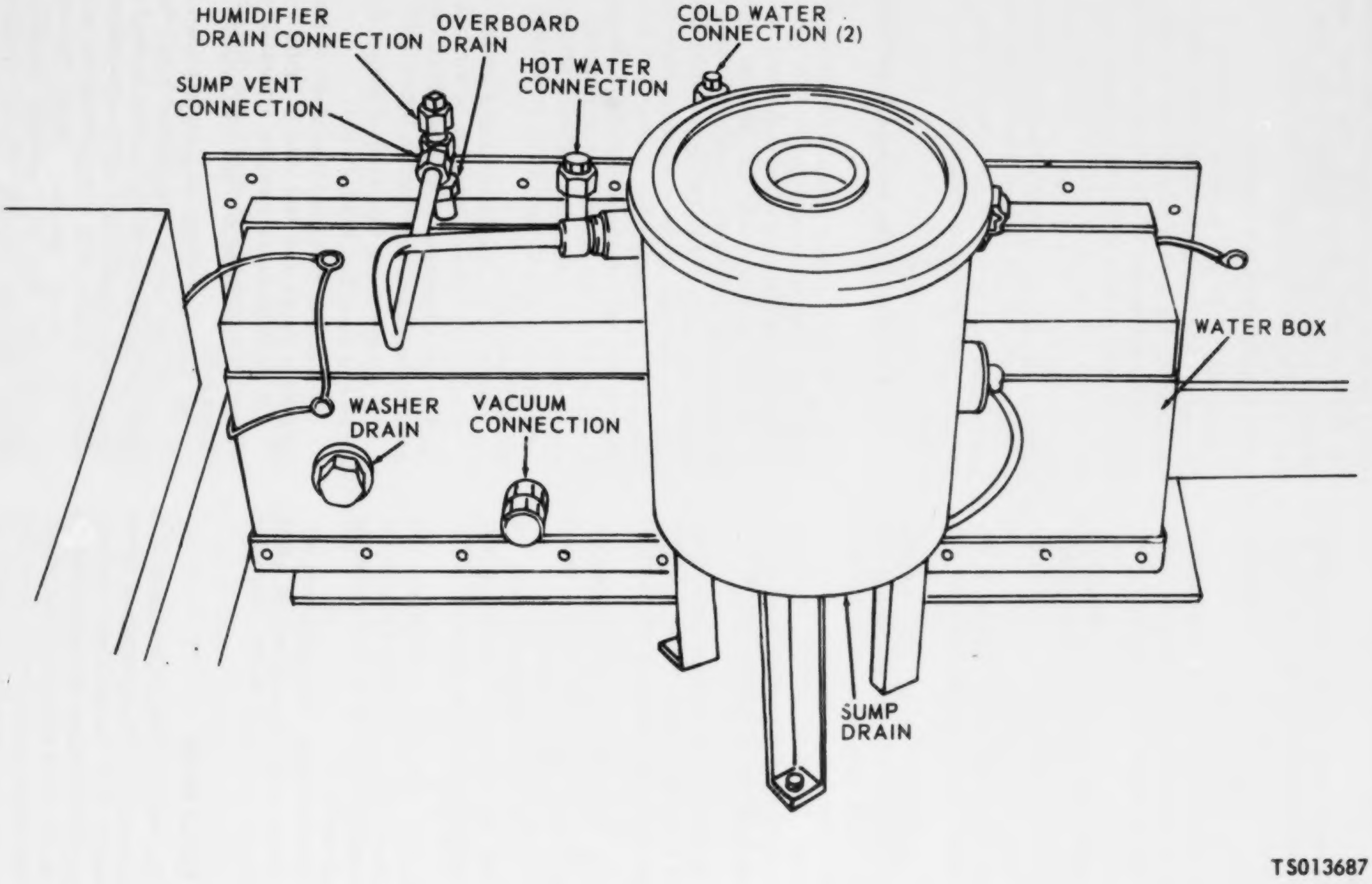

HUMIDIFIER DRAIN CONNECTION
OVERBOARD DRAIN
COLD WATER CONNECTION (2)
SUMP VENT CONNECTION
HOT WATER CONNECTION
WATER BOX
WASHER DRAIN
VACUUM CONNECTION
SUMP DRAIN
TS013687

Figure 2-6. Water Box Interior Connections and Sump Installation (TS 013687)

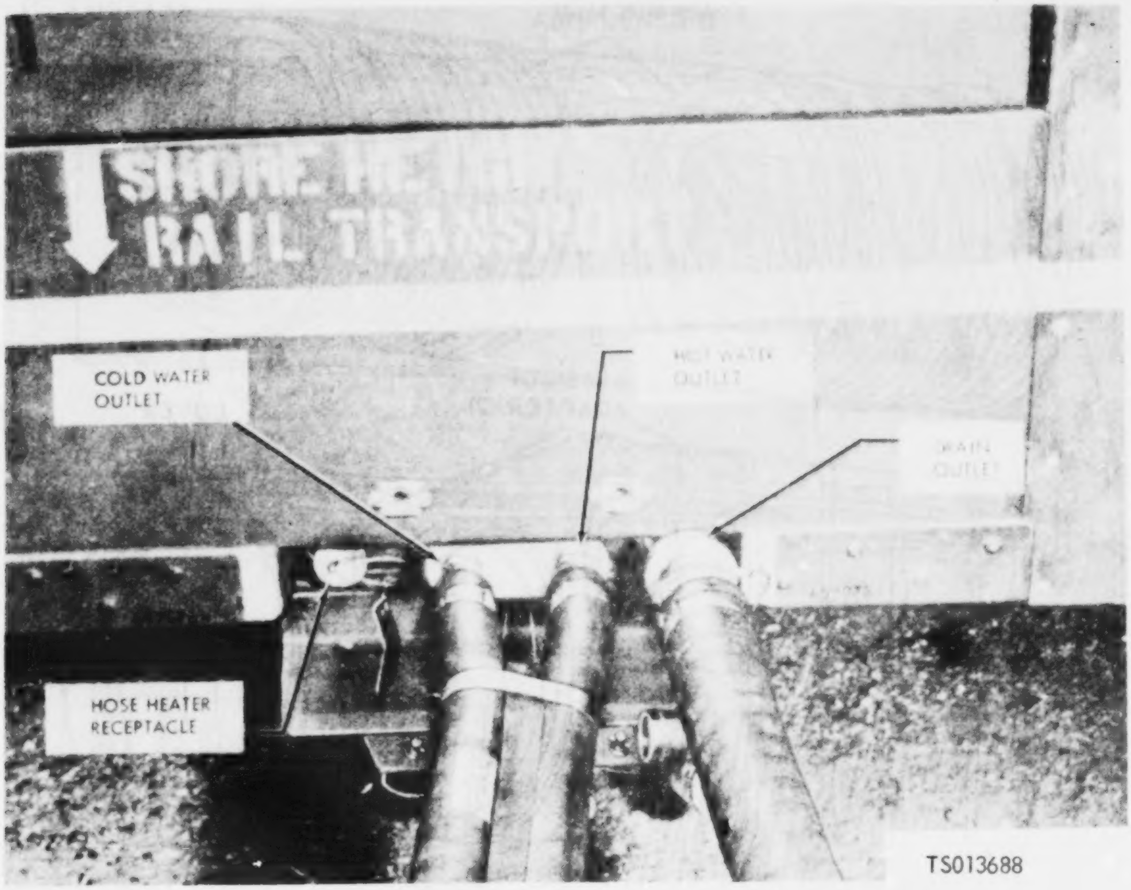

SHORE HE
RAIL TRANS
COLD WATER OUTLET
HOT WATER OUTLET
DRAIN OUTLET
HOSE HEATER RECEPTACLE
TS013688

Figure 2-7. Water Outlet Panel with Hose Assemblies Attached (TS 013688)

the open position. Circuit breakers may be reset by pressing in to close the circuit after overload condition has been corrected. For location and function of circuit breakers, refer to figure 2-3.

(6) *Leveling jacks.* Leveling jacks (fig. 2-1) will be maintained at a level position under all conditions to prevent damage to the shelter.

2-13. Consumable Supplies

Refer to table 2-1 for the consumable supplies used with the shelter.

Table 2-1. Consumable Supplies

(1) Item	(2) National Stock Number	(3) Description	(4) Unit
Adhesive (Contact Cement)	8040-00-290-4301	1357	Qt. (.95 liters)
Toluene	6810-00-281-2002		Gal. (3.8 liters)
Brushes	8020-00-597-4762	1 in. w x 1¾ in. (2.5 w x 4.4cm)	
Paper Towels (Kim Wipes)	7920-00-543-6492		
Enamel. Semi-gloss Pale green		Color No. 24554 or equal TT-E-529	
Enamel Flat Olive drab	8010-00-297-0560	Color No. 34087 or equal (TT-E-527	

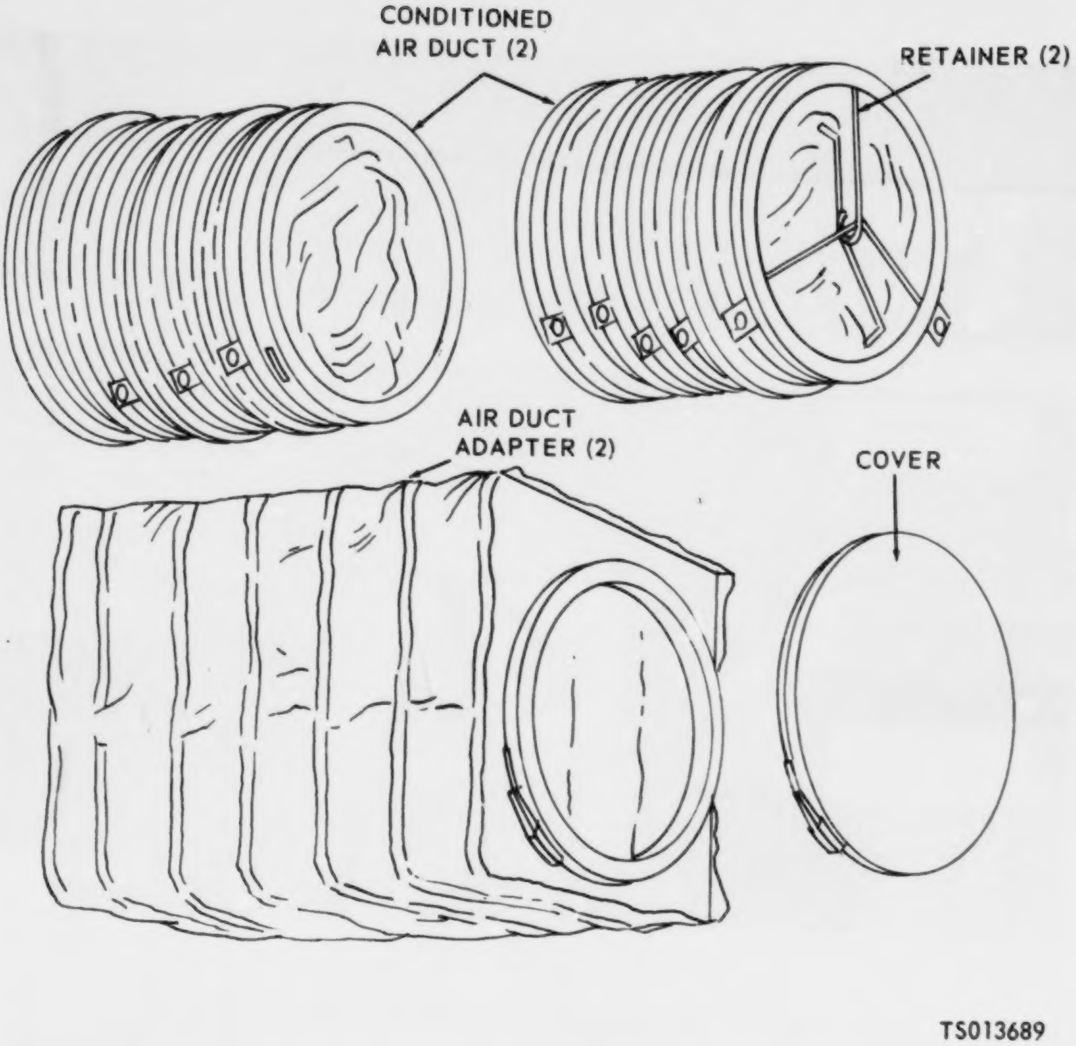

CONDITIONED AIR DUCT (2)
RETAINER (2)
AIR DUCT ADAPTER (2)
COVER
TS013689

Figure 2-8. Air Duct Adapter Assembly (TS 013689)

Table 2-1. Consumable Supplies—Continued

(1) Item	(2) National Stock Number	(3) Description	(4) Unit
Paddle, Mixing		889351-61 (26533)	
Coated Cloth		Type 1, Class 1 MIL-C-43285 (OG & Black)	
Mixing Cup	7350-00-178-6784		
Talc Lubricant	2640-00-264-6642		
Sealant		EC776 (3M Co.)	
Epoxy	8040-00-042-8761		
Adhesive Primer	8040-00-598-5164	1007P (Bostik	Qt. (95 liters)
Zipper Lubricant		Zipper Ease	

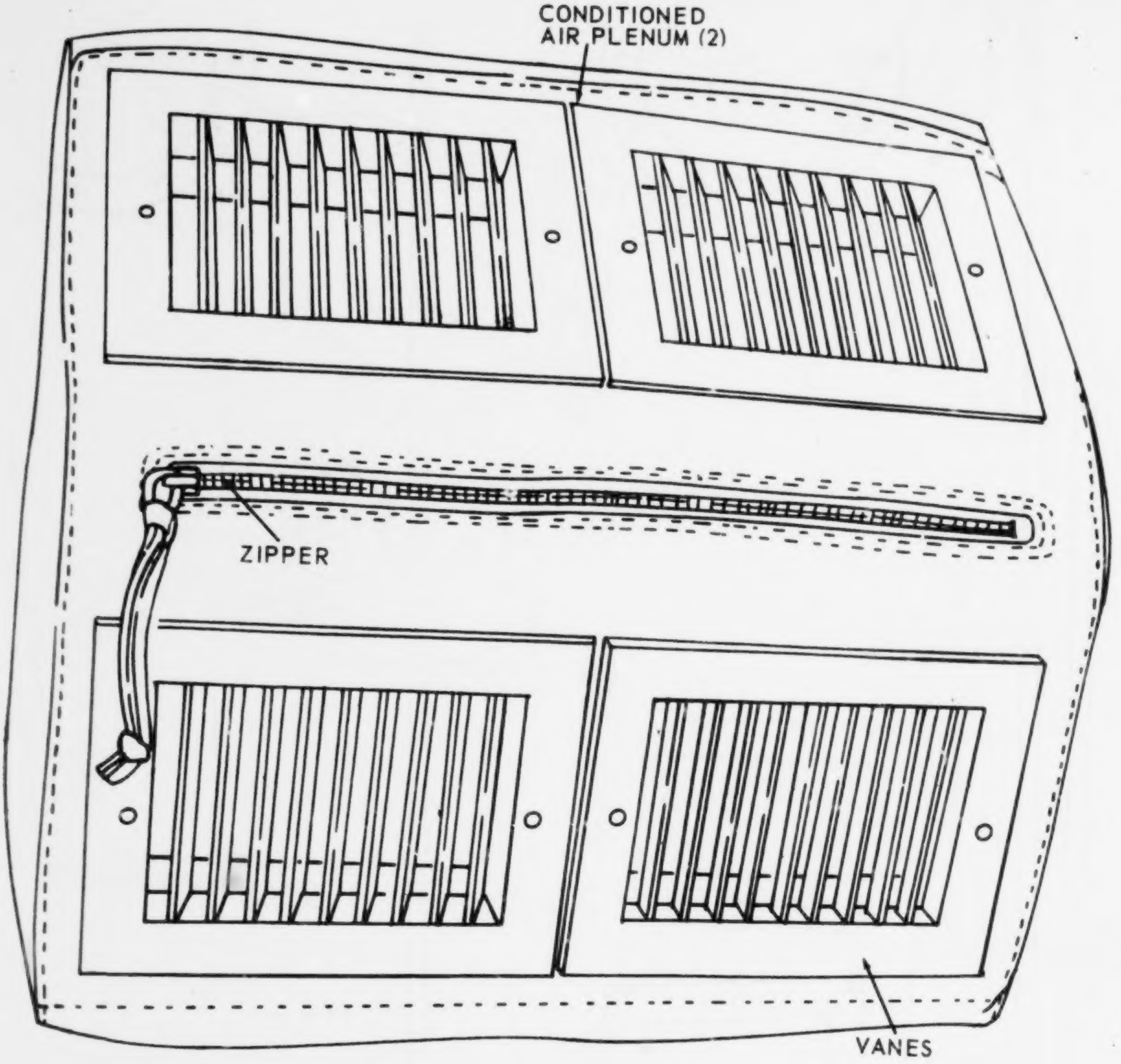
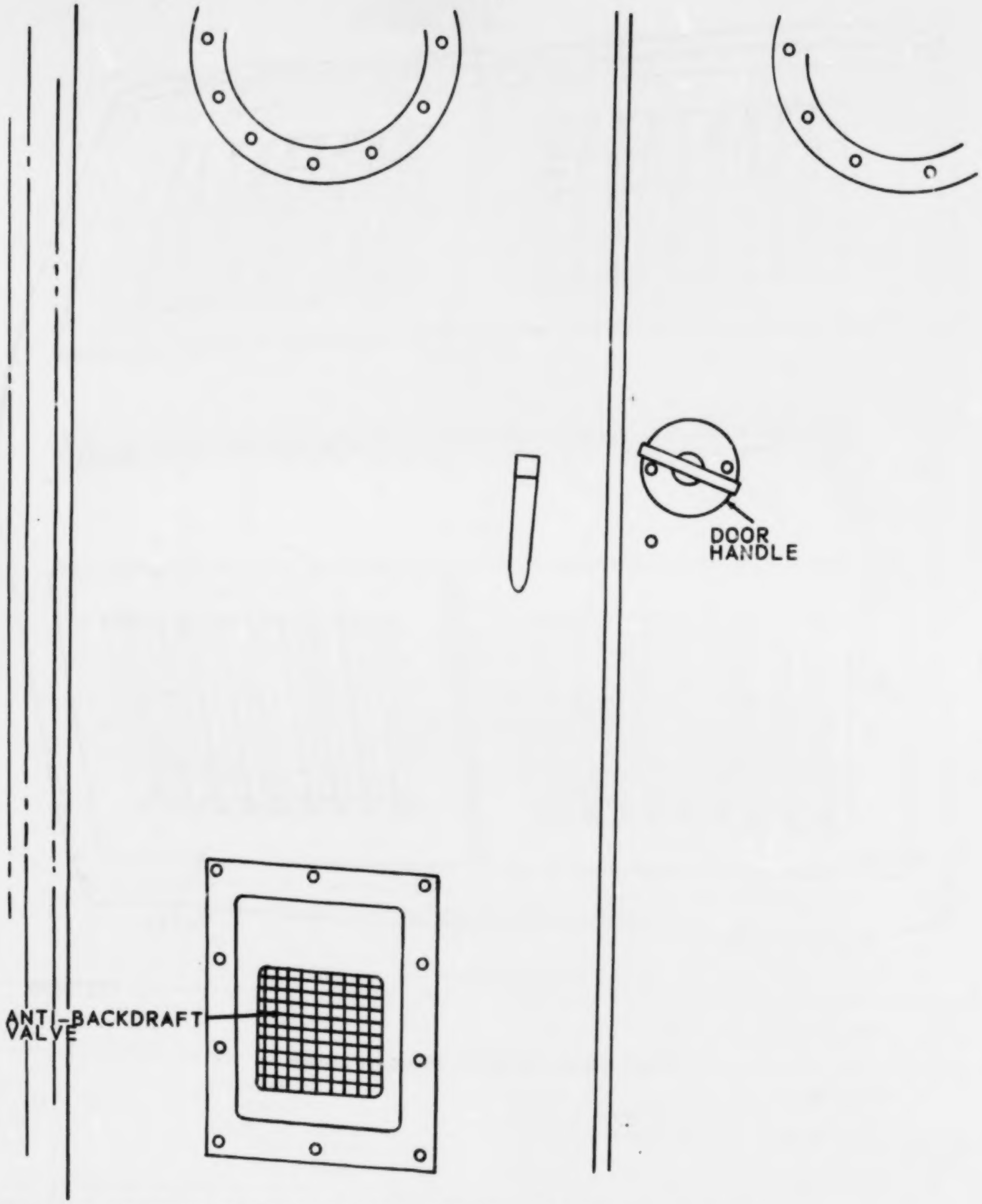

CONDITIONED
AIR PLENUM (2)
ZIPPER
VANES
TS013690

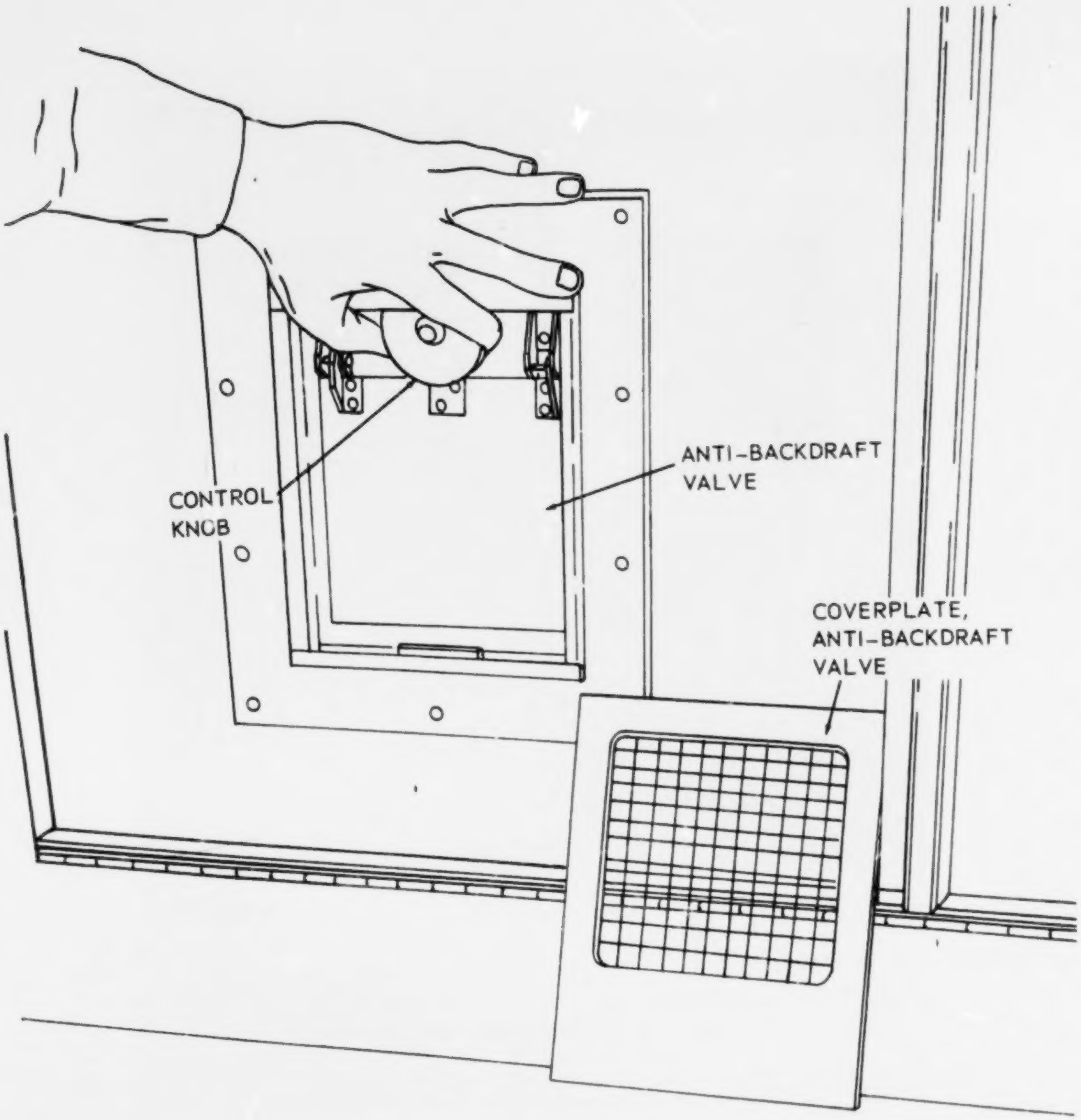
Figure 2-9. Air Distribution Plenum (TS 013690)


DOOR HANDLE
ANTI-BACKDRAFT VALVE

LIFT UP ON DOOR HANDLE TO HORIZONTAL POSITION TO OPEN.
CLOSE DOOR BY PLACING HANDLE DOUNWARD TO CLOSE POSITION.

TS013691

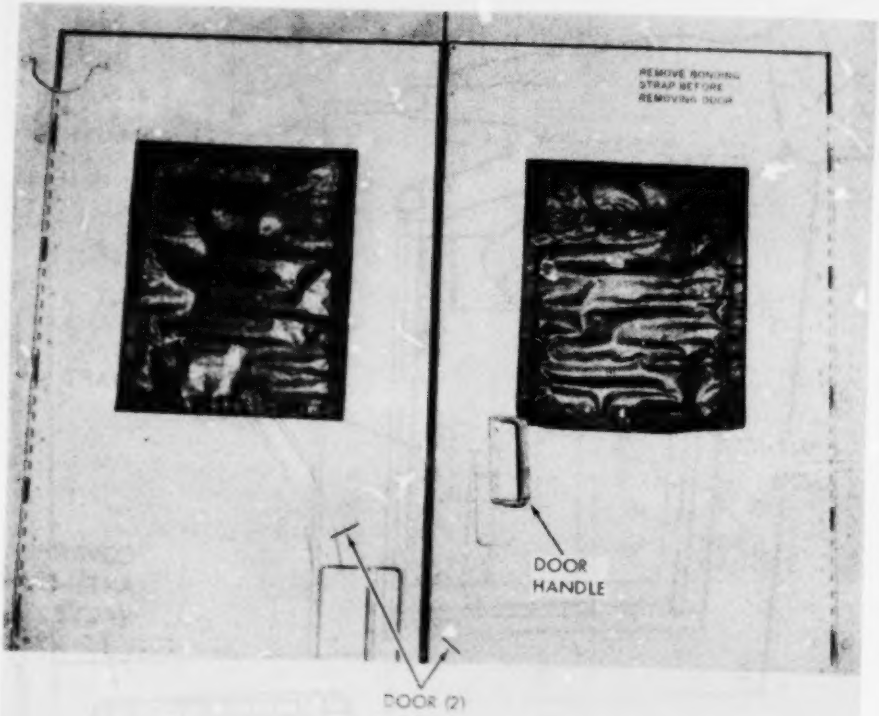
Figure 2-10. Operation of Air Lock Door Handles and Anti-Back-draft Valve (Sheet 1 of 2) (TS 013691)


CONTROL KNOB
ANTI-BACKDRAFT VALVE
COVERPLATE, ANTI-BACKDRAFT VALVE

ADJUST ANTI-BACKDRAFT VALVE TO CONTROL RATE OF VALVE ACTION WHICH REGULATES THE SHELTER INTERNAL PRESSURE. TURN CONTROL KNOB CLOCKWISE TO DECREASE ACTION OF VALVE AND COUNTERCLOCKWISE TO INCREASE ACTION OF VALVE.

TS 013692

Figure 2-10. Operation of Air Lock Door Handles and Anti-Back Draft Valve (Sheet 2 of 2) (TS 013692)

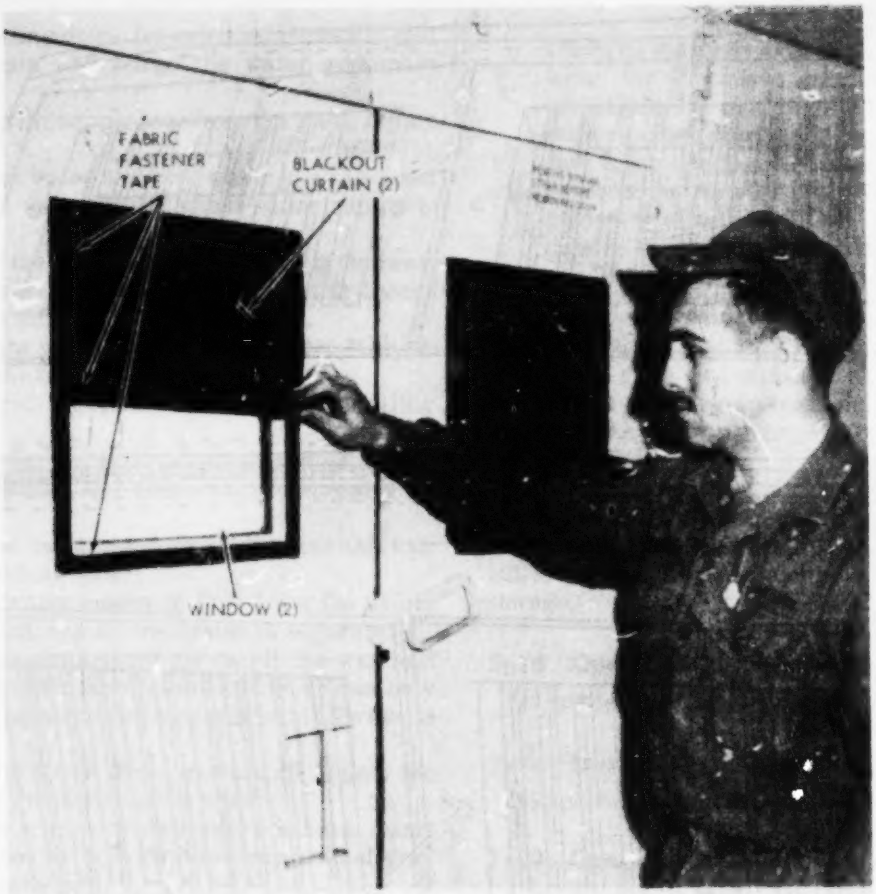

REMOVE BONDING
STRAP BEFORE
REMOVING DOOR
DOOR
HANDLE
DOOR (2)

OPEN: TWIST DOOR HANDLE COUNTERCLOCKWISE AND SWING DOOR INWARD.

CLOSE: SWING DOOR CLOSED AND TWIST DOOR HANDLE CLOCKWISE TO LATCH.

TS 013693

Figure 2-11. Operation of Shelter Door (TS 013693)

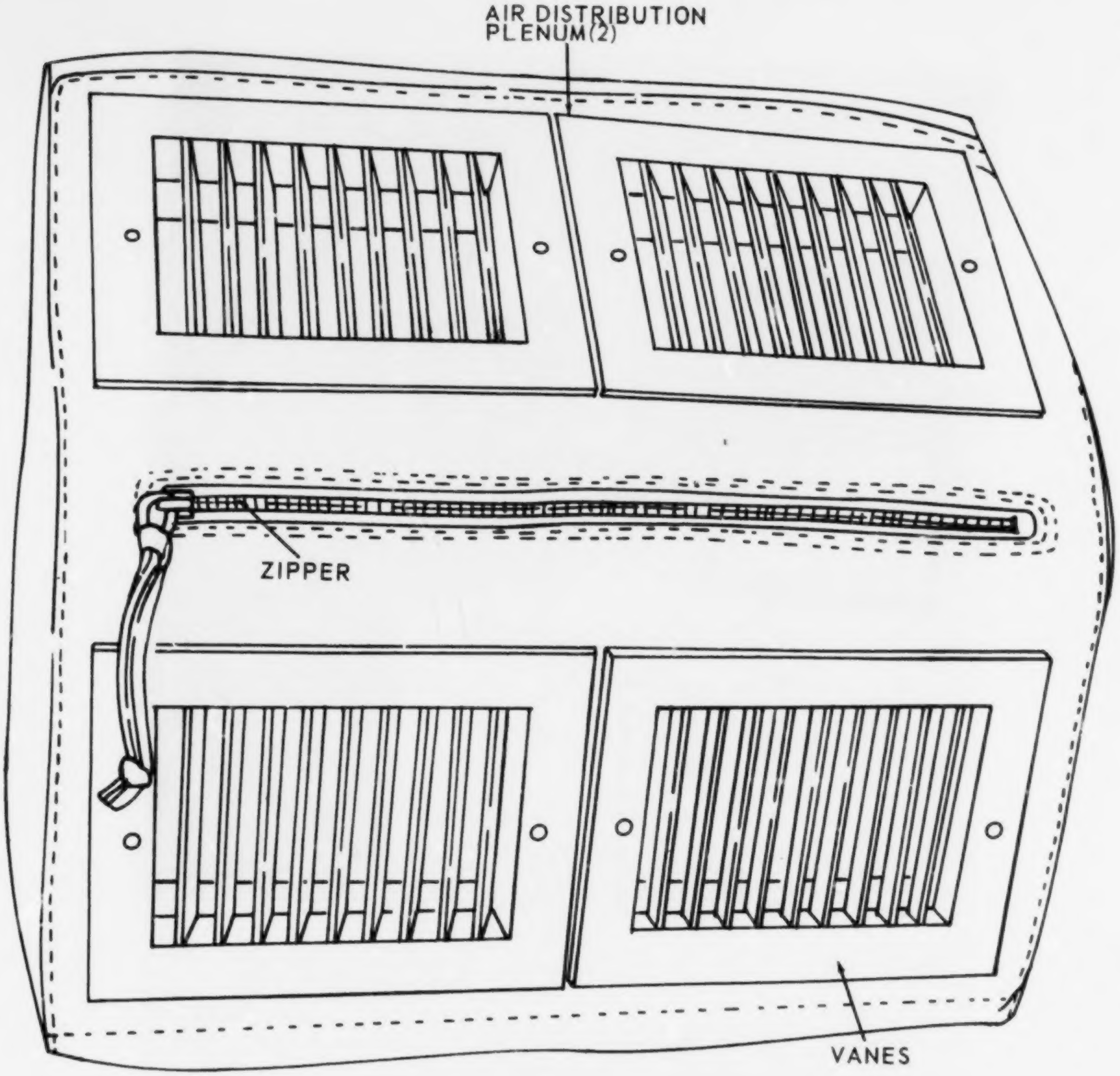

FABRIC
FASTENER
TAPE
BLACKOUT
CURTAIN (2)
WINDOW (2)

CLOSING: UNROLL BLACKOUT CURTAIN AND PLACE CURTAIN OVER WINDOW. PRESS AGAINST OUTER EDGE OF CURTAIN TO SEAL FABRIC FASTENER TAPE. CHECK FROM OUTSIDE OF SHELTER TO ENSURE NO LIGHT CAN BE SEEN AROUND CURTAIN.

OPENING: LIFT UP ON BOTTOM EDGE OF BLACKOUT CURTAIN AND ROLL CURTAIN UP. SECURE CURTAIN WITH FABRIC FASTENER TAPE AT TOP OF CURTAIN.

TS013694

Figure 2-12. Operation of Blackout Curtains (TS 013694)


AIR DISTRIBUTION
PLENUM(2)
ZIPPER
VANES

TS013695

Figure 2-13. Operation of Conditioned Air Plenum (TS 013695)

Section II. OPERATION UNDER UNUSUAL CONDITIONS

2-14. Operation in Extreme Cold

When shutting down, for extended periods in cold weather, drain and purge the water system as follows:

a. Remove the supply hose from the water supply tank.

b. Flow hot water and cold water into the closet shelter until the utility element water supply is depleted.

c. Shutoff the water pumps in the utility element.

d. Disconnect the hot water recirculating hose at the valve shutoff on the utility element.

e. Drain the utility element hot water tank by turning on the tank drain valve.

f. Open up all the other water drains at the utility element.

g. Disconnect the external water supply hose at the utility element and connect the compressed air hose.

h. Open the compressed air valve about half way to purge residual water.

i. As the water ceases to flow from the utility element drains, cap all the drains in sequence.

j. Turn the compressed air on all the way and operate the shelter faucets until no water flows, only air. Depress nozzle on flex hose only until all water is purged.

k. Open the faucet drain valves and actuate the faucets with the drain valves open.

l. With the sump cover strainer removed, insert the compressed air hose into the sump drain. Purge sump and drain line.

m. Close the hot and cold water valves on the utility element.

n. Disconnect the dual water hose and the supply and drain water hose from the connection panel. Drain all hoses and purge. Coil hoses and secure ends for storage.

o. Drain and purge all hoses and shelter plumbing.

p. Drain the utility element water system as follows:

(1) Remove drain caps from hot water tank, heat-exchanger and surge tank drains. Open hot and cold water faucets, the drain, and return valves and the hot water and surge tank vent valves until all water has drained from the system, then close vent valves.

(2) Connect compressed air hose assembly to compressed air outlet fitting. Hold discharge end of air hose assembly against cold water outlet fitting. Open compressed air valve approximately 20-to-30-Deg to deliver a small flow of compressed air into water system to purge residual water.

CAUTION

Observe water system tank and plumbing for excessive heating due to purge air. If external temperature of water system components approaches safe touch temperature, decrease compressed air flow or shut off air flow completely until system cools. Excessive temperatures will damage the pump and valve seals.

(3) When all water has been purged, note which water connection is discharging maximum amount of air, then close that connection. Continue to close connections discharging maximum amount of air until only one connection remains open, then shutoff compressed air. Remove air hose assembly from cold water outlet fitting and close remaining connection and cold water outlet valve. Disconnect compressed air hose assembly from compressed air outlet fitting, coil hose assembly, and secure ends for storage.

2-15. Operation in Extreme Heat

No special operations required.

2-16. Operation in Dusty or Sandy Areas

No special operations required.

2-17. Operation Under Rainy or Humid Conditions

Procedures for operation under rainy conditions are as follows:

a. Ditch around outskirts as shown in figure 2-14.

b. Provide adequate drainage ditches to prevent standing water entering air lock chamber.

c. Close and secure all doors.

2-18. Operation in Salt Water Areas

No special operations required.

2-19. Operation in Snow and Ice

Procedures for operation in snow and ice areas are as follows:

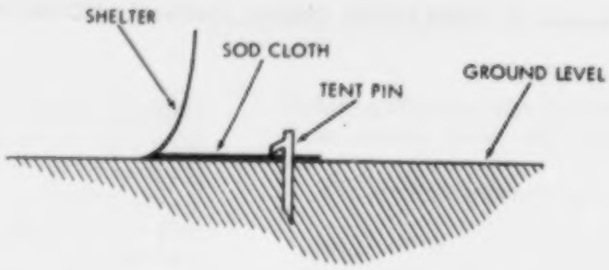
a. Apply bleed air and/or hot air from utility heating unit to fabric of air lock to assist in erection.

b. Remove snow from exterior of shelter with a soft bristled brush or broom.

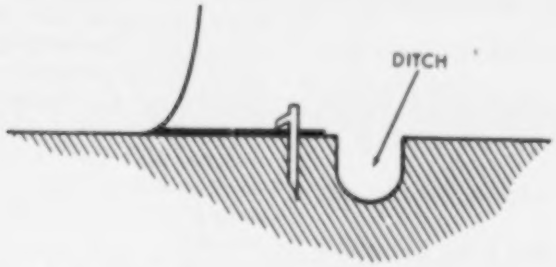
c. Remove ice build-up by applying bleed air and/or hot air from utility heating unit.

2-20. Operation in Mud

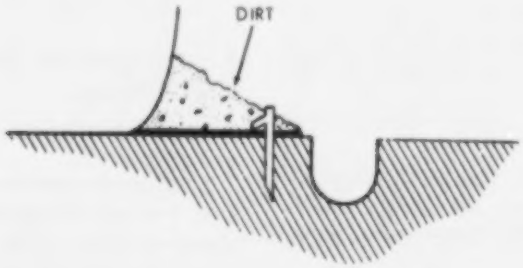
No special operations required.



1 ENSURE SHELTER IS POSITIONED AS SHOWN.



2 DIG DITCH COMPLETELY AROUND SHELTER AT LEAST 6 INCHES DEEP.



3 PILE DIRT REMOVED FROM DITCH ON SOD CLOTH AND AGAINST SIDE OF SHELTER. ENSURE SOD CLOTH IS COMPLETELY COVERED.

TS 013696

Figure 2-14. Preparation for Rain (TS 013696)

2-21. Operation at High Altitudes

No special operations required.

2-22. Operation Below Sea Level

No special operations required.

2-23. Operation in High Winds

Procedures for operation in high winds are as follows:

a. Check that all air lock guy ropes, ground anchors, and tent pins are secured and that ropes are all tightened evenly.

b. Close and secure all doors.

c. Place sand bags, sod, or other available material on air lock sod cloth around outskirts of air lock.

CHAPTER 3
OPERATOR/CREW MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. Lubrication

Lubrication of the expandable shelter shall consist of lubrication of zipper with zipper lubricant.

3-2. Detailed Lubrication Information

a. Care of Lubricant. Keep all lubricant in closed containers, and store in a clean, dry place away from external heat. Do not allow dirt, dust, water, or foreign matter of any kind to mix with lubricant.

b. Lubrication. Lubricate all moving parts every 30 days or before administrative storage.

NOTE

Oil base lubricants shall not be used for floor and ceiling hinges.

c. Cleaning After Lubrication. After every lubrication operation, remove any excess lubrication from the point of application. Wipe up any spillage or drippage. Keep all areas not requiring lubrication, clean from lubrication.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-3. General

To ensure that the expandable shelter is ready for use at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraph 3-4. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during use of the shelter will be noted for future correction, to be made as soon as use is discontinued. Stop use immediately if a deficiency is noted which would damage shelter if use were continued. All deficiencies and shortcomings will be recorded together with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

3-4. Daily Preventive Maintenance Service

Preventive maintenance and services which must be performed by operator/crew are contained in table 3-1. The item numbers are listed consecutively and indicate the sequence of minimum inspection requirements. Refer to table 3-1 for the daily preventive maintenance services.

NOTE

When shelters are not in continuous use, PMCS will be performed semiannually. However, certain items (leveling jacks, windows, walls, etc.) on outside of shelter will have PMCS performed as scheduled.

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

B - Before operation D - During operation A - After operation
Time required: 2.0

Interval and sequence no.			Item to be inspected procedure	Work time (M/H)
B	D	A		
1	13	16	GUY ROPES AND CABLE ASSEMBLIES Check for even tension and for fraying or breaks. Tighten or replace guy ropes or cable assemblies as required.	0.3
2	14	17	TENT PINS AND GROUND ANCHORS Check for secure installation reinstall pin or anchors as required	0.2
3		18	CONDITIONED AIR DUCTS Check air ducts for secure attachment and for holes, tears or other damage.	0.1
4		19	ELECTRICAL CONNECTIONS Check for secure installation of electrical connections.	0.1
5		20	PLUMBING CONNECTIONS Check for secure installation of plumbing connections	0.1

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services—Continued

B - Before operation D - During operation A - After operation
Time required: 2.0

Interval and sequence no.			Item to be inspected procedure	Work time (M/H)
B	D	A		
6		21	SHELTER FABRIC Check fabric inside and outside of air lock for wear at seams, for broken stitches, for holes, for weak spots, or other damage to fabric.	
7		22	ZIPPERS Check zippers for smooth operation, complete closure, missing teeth, unstitched seams or other damage	0.1
8		23	FABRIC FASTENER TAPE Check for damage and unstitched seams	0.1
9		24	ELECTRICAL SYSTEM Check all electrical connections, cables, receptacles, circuit breakers and light assemblies for damage, burned contacts or insulation. Check light assemblies for burned or weak tubes.	0.1
10		25	PLUMBING SYSTEM Check all lines and fittings for leaks, or other damage, check pump and float switch operation.	0.2
11		26	BELLOW ADAPTER Check fabric inside and outside of bellows for wear at seams, for fabric stitches, for holes, for weak spots, or other damage.	0.1
12	15	27	SUMP CONTAINER Inspect drain sump assembly for damaged threads, nicks, dents, or burrs. If possible, dress all nicks and burrs with emery cloth assuring that enough wall thickness of sump remains to assure sufficient strength.	0.4

Section III. TROUBLESHOOTING

3-5. General

a. This section contains troubleshooting or malfunction information and tests for locating and connecting most of the troubles which may develop in the expandable shelter. Each malfunction or trouble symptom for an individual component or unit is followed by a list of tests or inspections, necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed (except when malfunctions and cause are obvious), or is not corrected by listed corrective actions, you should notify organizational maintenance.

3-6. Operator Maintenance Troubleshooting

Table 3-2 lists the common malfunctions that you may find during the operation or maintenance of the expandable shelter or its components. You should perform the tests/inspections and corrective actions.

Table 3-2. Troubleshooting

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

1. WATER LEAKAGE INTO SHELTER

Step 1. Check weather seal assemblies for damage.
Report discrepancy to organizational maintenance.
Step 2. Check for loose or improperly positioned assemblies.
Position seal assemblies to cover joints in shelter and secure.

2. CIRCUIT BREAKER TRIPPER

Step 1. Check for overload condition and shorts using a multimeter or other chekcing device (para 11-2).
Reset circuit breaker by pushing reset button on control panel.
Step 2. Check for breaker malfunction using a multimeter and those instructions outlined in paragraph 11-2.
Report discrepancy to organizational maintenance.

3. NO ELECTRICAL POWER INSIDE SHELTER

Step 1. Check for a tripped circuit breaker and overload condition and shorts using a multimeter or other checking device (para 11-2).
Reset circuit breaker by pushing reset button on control panel.
Step 2. Check to see if external power source is connected.
Connect external power source.

4. NO HOT WATER OR COLD WATER INSIDE SHELTER

Step 1. Check for a disconnected water source.
Connect water hoses to water source connection.
Step 2. Check for a tripped water hose heater or water tunnel heater, and check for overload condition and shorts using a multimeter or other checking device (para 11-2).
Reset circuit breaker by pushing reset button on control panel.

5. WASTE WATER WILL NOT DRAIN OR DRAINS SLOWLY

Step 1. Check for clogged drain hose or lines.
Clean drain hose and lines.
Step 2. Check for a dirty filter screen in sump.
Remove and clean screen.
Step 3. Check sump pump circuit breaker and water tunnel heater or drain hose heater circuit breaker tripped, and check for overload condition and shorts (para 11-2).
Reset circuit breaker by pushing reset button on control panel.
Step 4. Check for clogged valve or sump.
Report discrepancy to organizational maintenance.
Step 5. Check for a worn or deteriorated drain hose heater.
Report discrepancy to organizational maintenance.

Section IV. MAINTENANCE PROCEDURES

All damage requiring repair or replacement shall be reported to organizational maintenance. Deviations may be authorized by the commanding officer to meet his operational requirements.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspecting and Servicing the Equipment

a. General. New expandable shelters are shipped uncrated. Upon receipt of an expandable shelter, carefully inspect the shelter for any damage that may have occurred during transport. Report any damage of expandable shelter to proper authority.

b. Inspection. Inspect the expandable shelter components (figs. 4-1 through 4-4) to ensure that all components are present. Report any missing components to proper authority. Inspect all components for tears, ruptures, breaks, or other obvious shipping or storage damage. Report any damage to proper authority.

NOTE

During installation procedures (para 4-2), carefully inspect all components for holes, tears, or cuts; broken or missing bolts, nuts, screws, rivets and other attaching hardware.

4-2. Installation

a. General. Refer to the following instructions before installing or erecting the expandable shelter.

(1) *Personnel requirements.* Under average field conditions, the expandable shelter can be set up and ready for use in approximately 30 minutes using a crew of six.

(2) *Site selection.* The site selected for erection of the expandable shelter shall be in accordance with functional requirements and convenient to the other elements of the installation. If possible, a site which is fairly level with good drainage should be selected. If drainage is questionable, the area must be properly trenched to ensure adequate drainage away from the shelter. The site selected for the shelter must be cleared of rocks, stumps or debris. Fill all holes and level all mounds which might interfere with a reasonably level erection site.

(3) *Ground plan.* The ground plan dimensions are shown in figure 4-5. The ground plan is provided to give guidance for the location of shelter tent pins, and ground anchors. Careful study of the ground plan should accompany erection of the shelter.

b. Erection Procedures. Figure 4-6 provides step by step instructions for erection of the expandable shelter.

NOTE

The erection procedures provided in figure 4-6 are typical of both sides of the expandable shelter.

c. Cargo Tiedown Installation/Removal Procedures. Refer to the below listed instructions and remove the cargo tiedown installation.

(1) Remove the rope net assembly (3, fig. 4-7) by removing the tiedown ropes securing it to the strap assembly (1).

(2) Remove the web net assembly (2) from the cargo top.

(3) Remove the strap assembly (1) from the shelter tiedown fitting by disconnecting the metal ring.

4-3. Equipment Conversion

a. Expandable shelters may be interconnected for various uses and positioned for desired floor plan or complex layout. Removable panels and swinging door panels may be interchanged to facilitate interconnection and access to shelters.

b. Refer to the special text (8 series) for the shelter's inter-connection with the hospital.

c. Conversion of expandable shelter is as follows:

(1) *Interchanging removable panels and swinging door panels.* Interchanging removable panels and swinging door panels may be accomplished as shown and described in figure 4-8.

(2) *Installation of bellows section and tread plates.* Interconnection of expandable shelters is shown and described in figure 4-9.

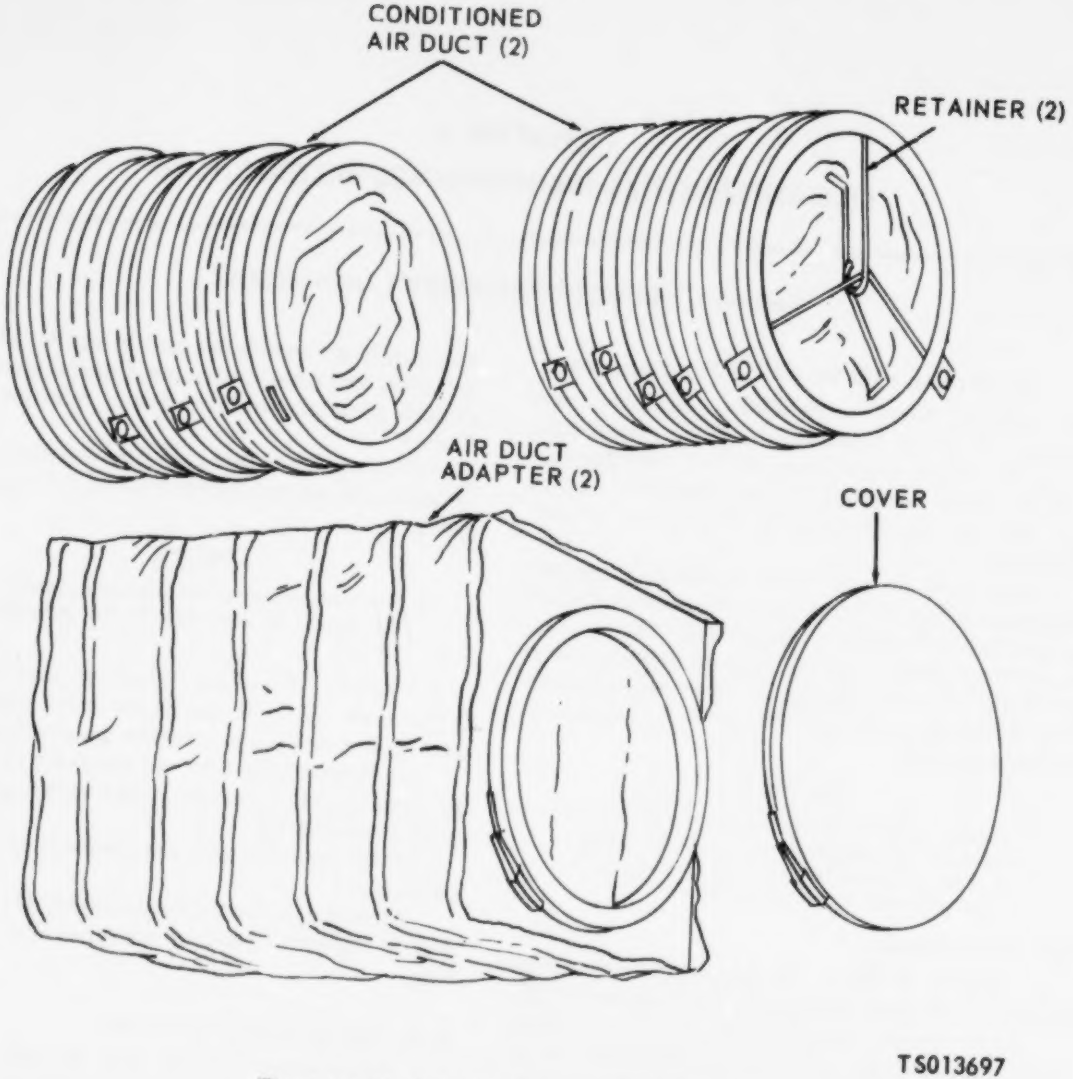

CONDITIONED
AIR DUCT (2)
RETAINER (2)
AIR DUCT
ADAPTER (2)
COVER
TS013697

Figure 4-1. Air Duct Adapter Assembly (TS 013697)

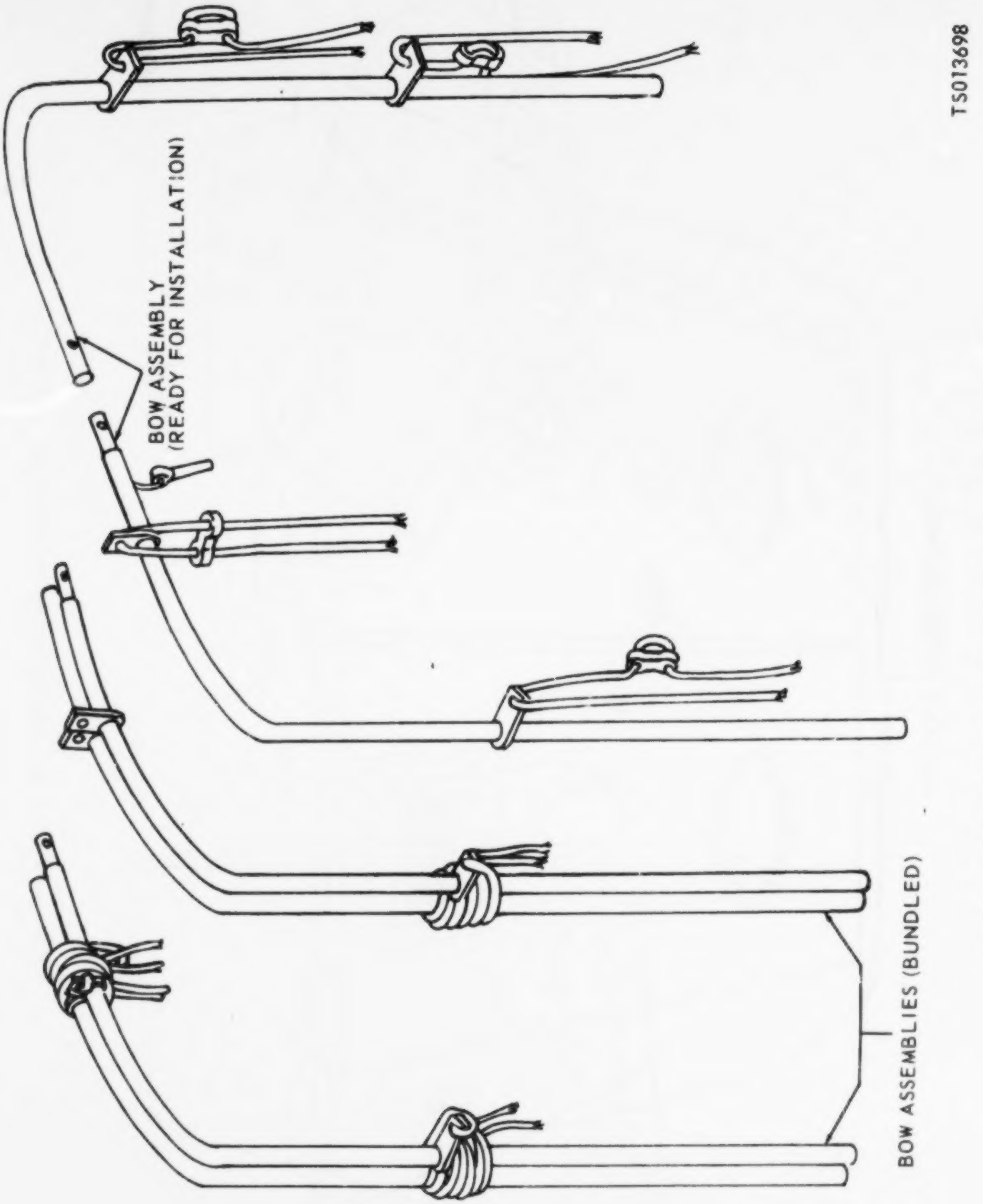

BOW ASSEMBLY
(READY FOR INSTALLATION)
BOW ASSEMBLIES (BUNDLED)
TS013698

Figure 4-2. Air Lock, Bow, Body and Door Assemblies (Sheet 1 of 3) (TS 013698)

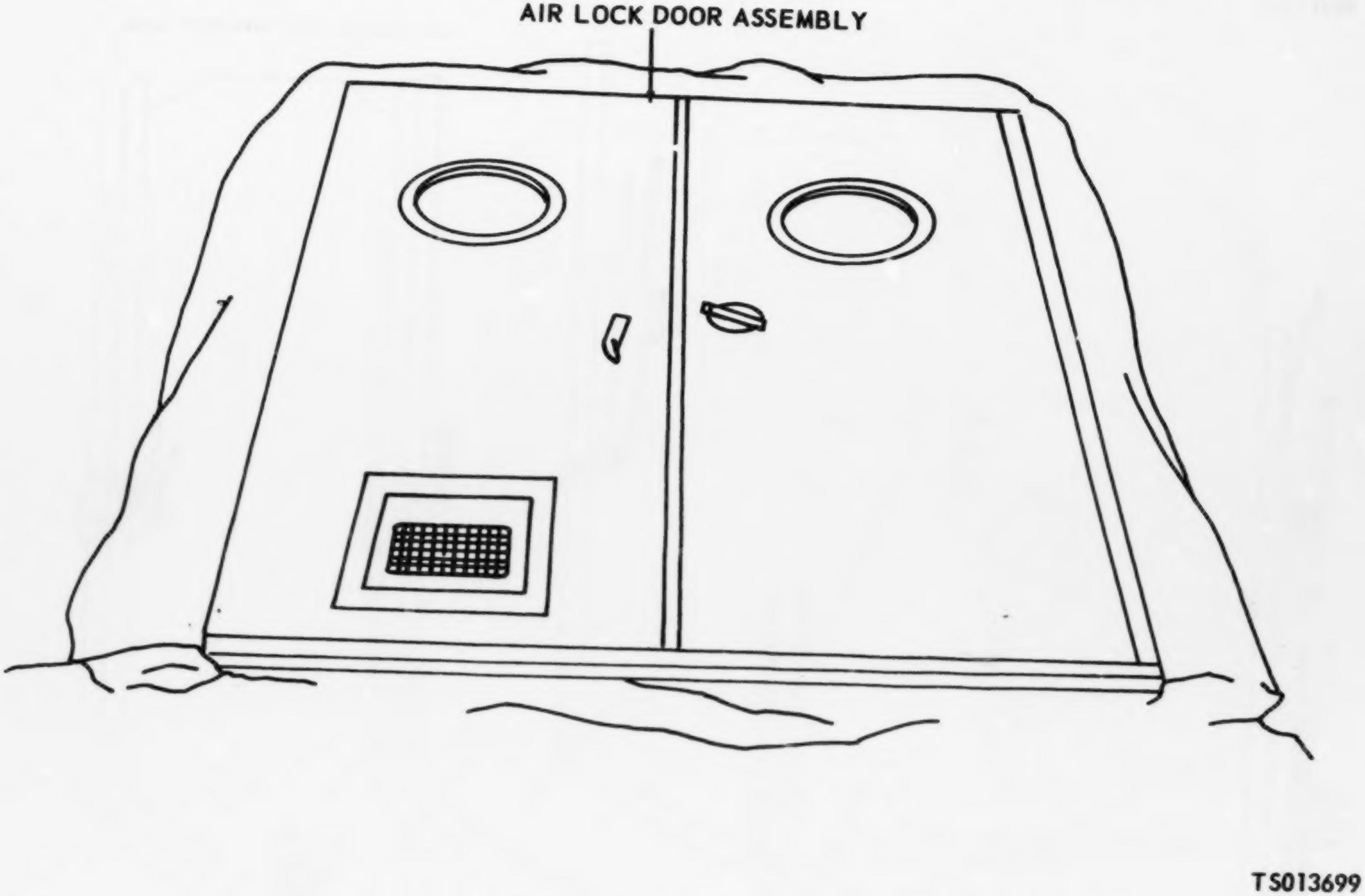

AIR LOCK DOOR ASSEMBLY
TS013699

Figure 4-2. Air Lock, Bow, Body and Door Assemblies (Sheet 2 of 3) (TS 013699)

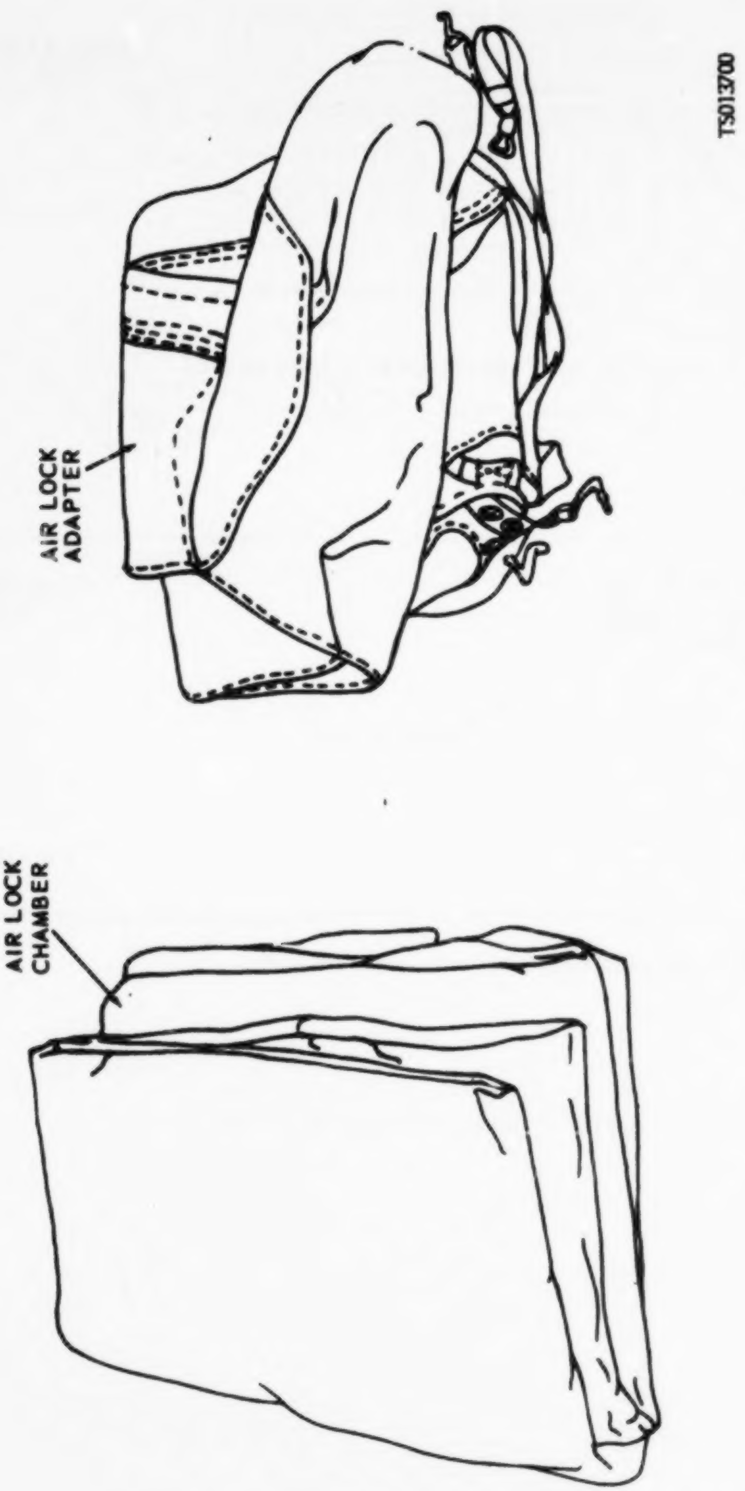

AIR LOCK ADAPTER
AIR LOCK CHAMBER
TS013700

Figure 4-2. Air Lock, Bow, Body and Door Assemblies (Sheet 3 of 3) (TS 013700)

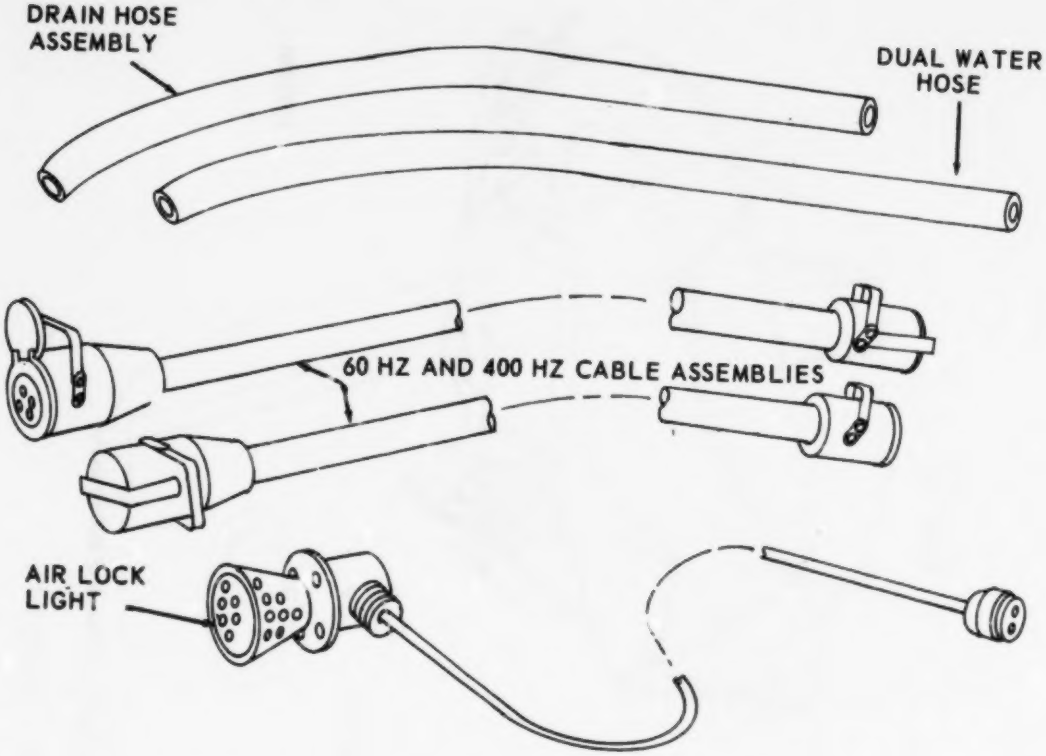
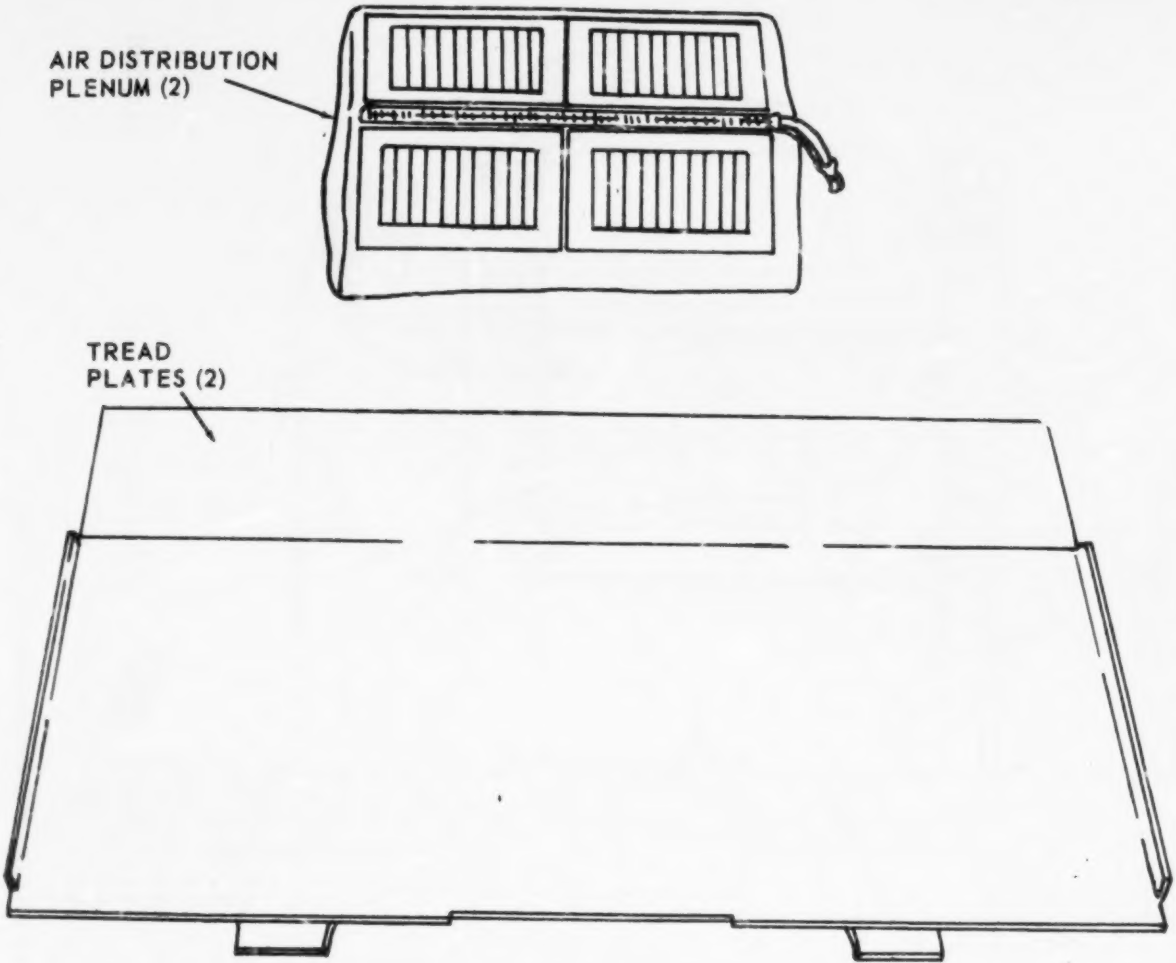
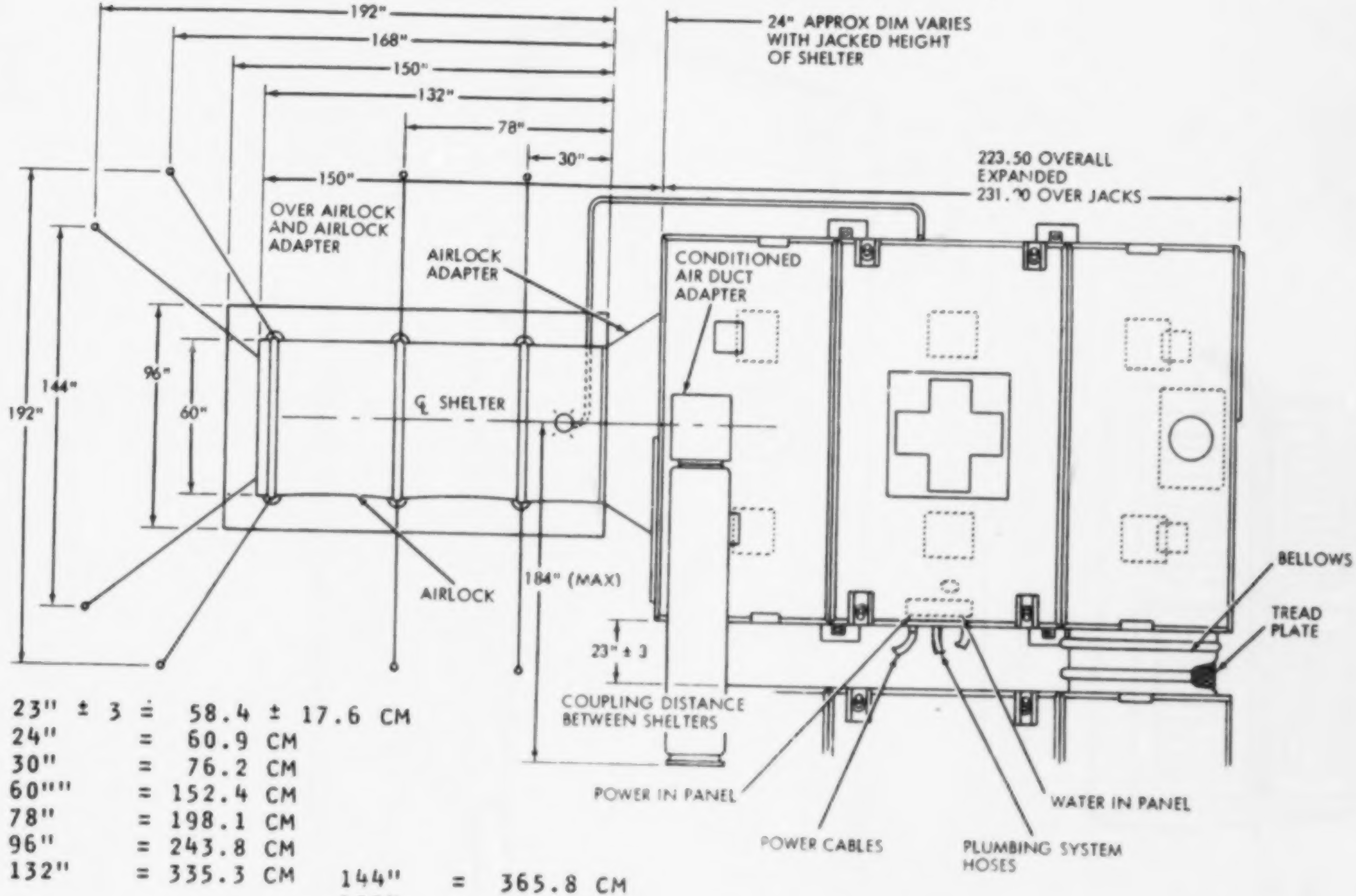

DRAIN HOSE ASSEMBLY
DUAL WATER HOSE
60 HZ AND 400 HZ CABLE ASSEMBLIES
AIR LOCK LIGHT
TS013701

Figure 4-3. Light, Hose and Cable Assemblies (TS 013701)


AIR DISTRIBUTION PLENUM (2)
TREAD PLATES (2)

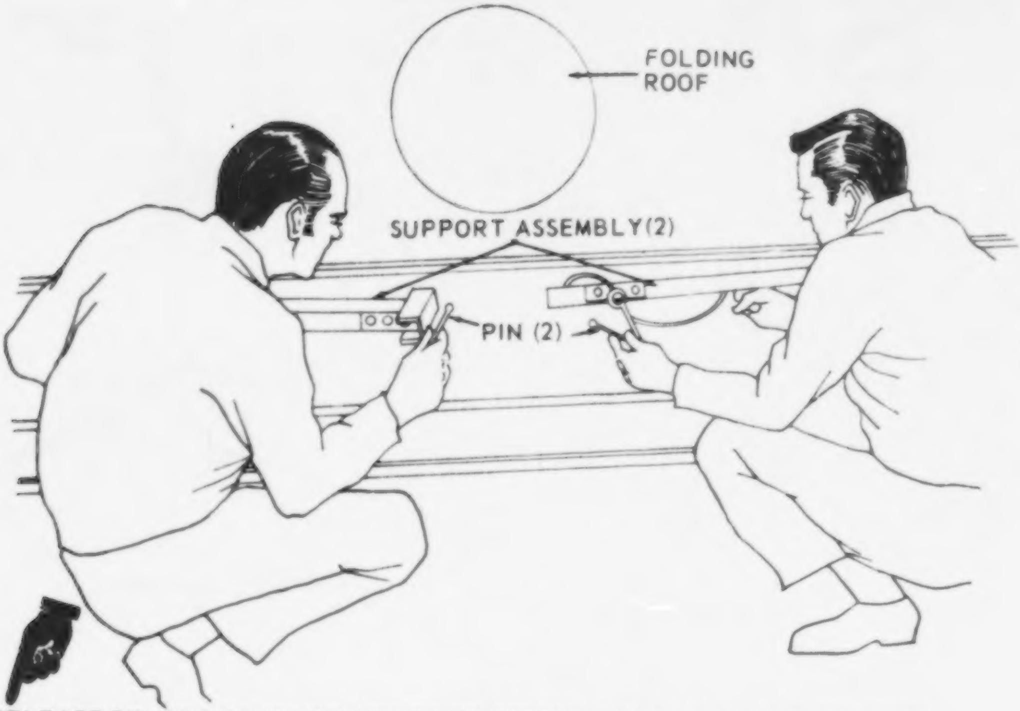
TS013702

Figure 4-4. Distribution Plenum and Tread Plates (TS 013702)


192"
168"
150"
132"
78"
30"
24" APPROX DIM VARIES WITH JACKED HEIGHT OF SHELTER
223.50 OVERALL EXPANDED
231.00 OVER JACKS
150"
OVER AIRLOCK AND AIRLOCK ADAPTER
AIRLOCK ADAPTER
CONDITIONED AIR DUCT ADAPTER
192"
144"
96"
60"
℄ SHELTER
AIRLOCK
184" (MAX)
23" ± 3
COUPLING DISTANCE BETWEEN SHELTERS
BELLOWS
TREAD PLATE
POWER IN PANEL
POWER CABLES
PLUMBING SYSTEM HOSES
WATER IN PANEL
TS 013703

23" ± 3 ≐ 58.4 ± 17.6 CM
24" = 60.9 CM
30" = 76.2 CM
60"'' = 152.4 CM
78" = 198.1 CM
96" = 243.8 CM
132" = 335.3 CM
144" = 365.8 CM
150" = 381 CM
168" = 426.7 CM
184" = 467.4 CM
192" = 487.7 CM
223.5" = 567.7 CM
231" = 586.7 CM

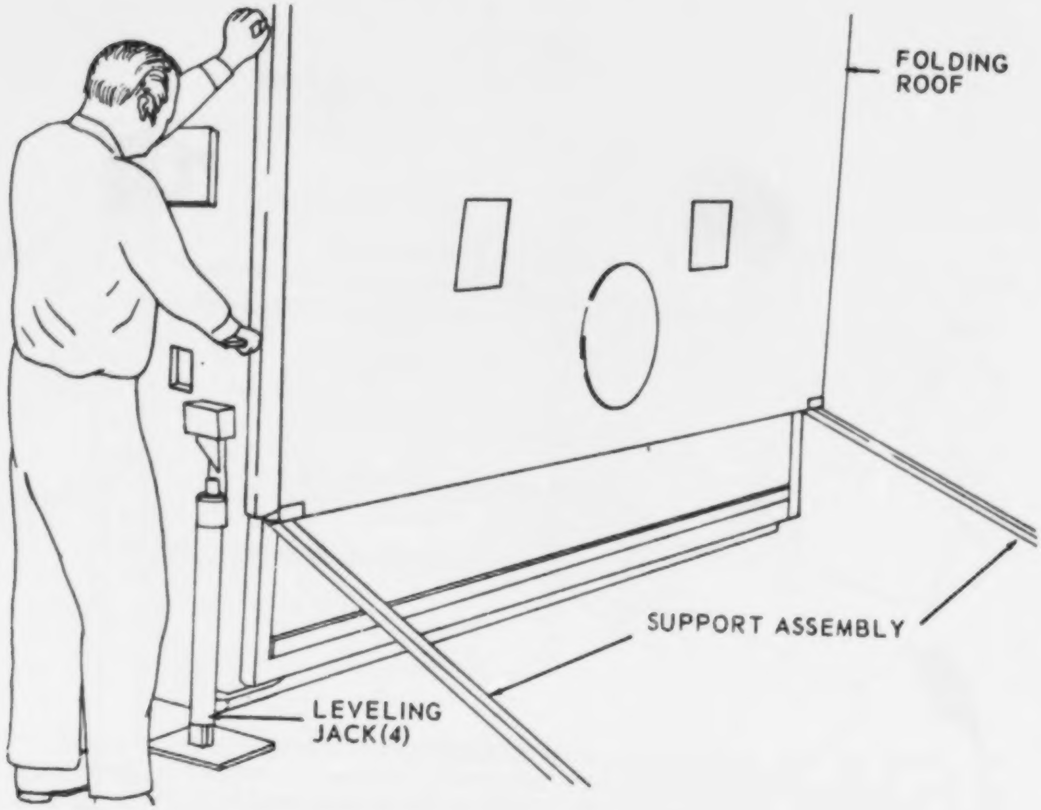
Figure 4-5. Plan View of Expandable Shelter (TS 013703)


FOLDING ROOF
SUPPORT ASSEMBLY(2)
PIN (2)

RELEASE PIN AND SEPARATE SUPPORT ASSEMBLIES FROM FOLDING ROOF. ON SHELTER SERIAL NO. 185 THRU 302 ONLY, REMOVE SUPPORT ASSEMBLIES FROM STOWAGE LOCATION INSIDE THE SHELTER AND INSTALL ONTO FOLDING ROOF AS SHOWN.

TS013704

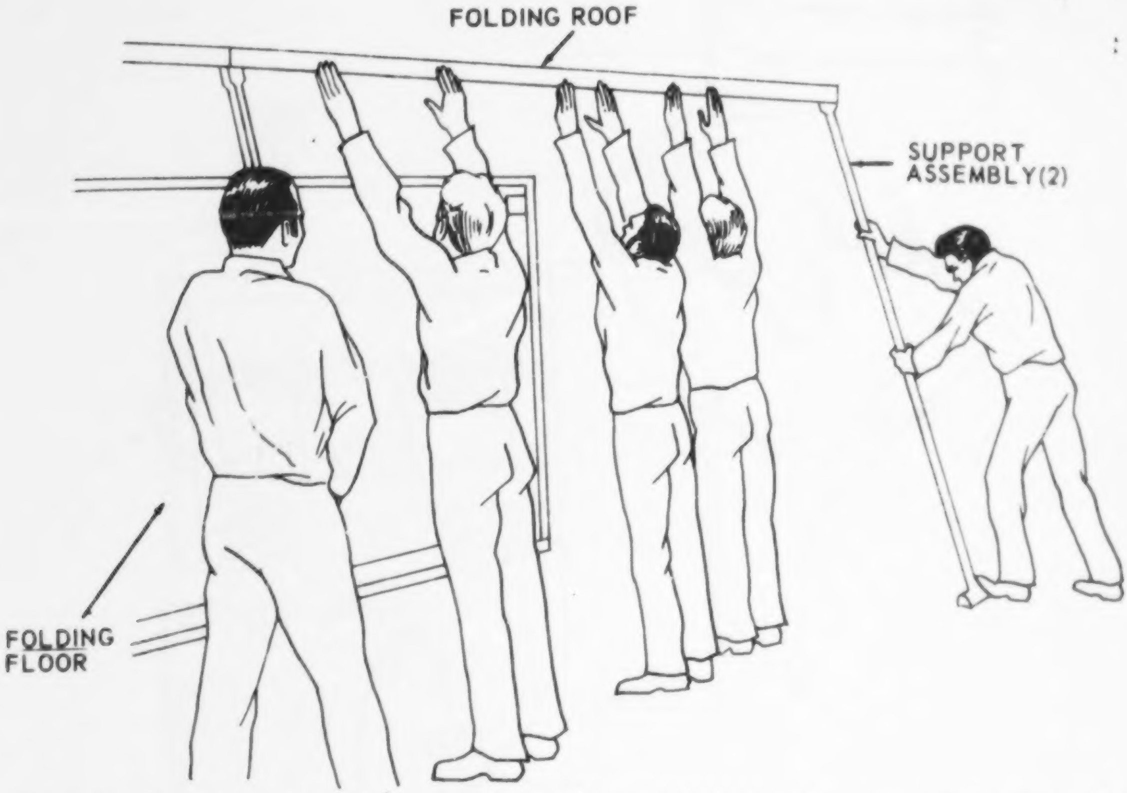
Figure 4-6. Erection of Expandable Shelter (Sheet 1 of 36)(TS 013704)


FOLDING ROOF
SUPPORT ASSEMBLY
LEVELING JACK(4)

SUPPORT SHELTER WITH LEVELING JACKS. SPREAD SUPPORT ASSEMBLIES AND RELEASE LATCHES SECURING FOLDING ROOF.

TS 013705

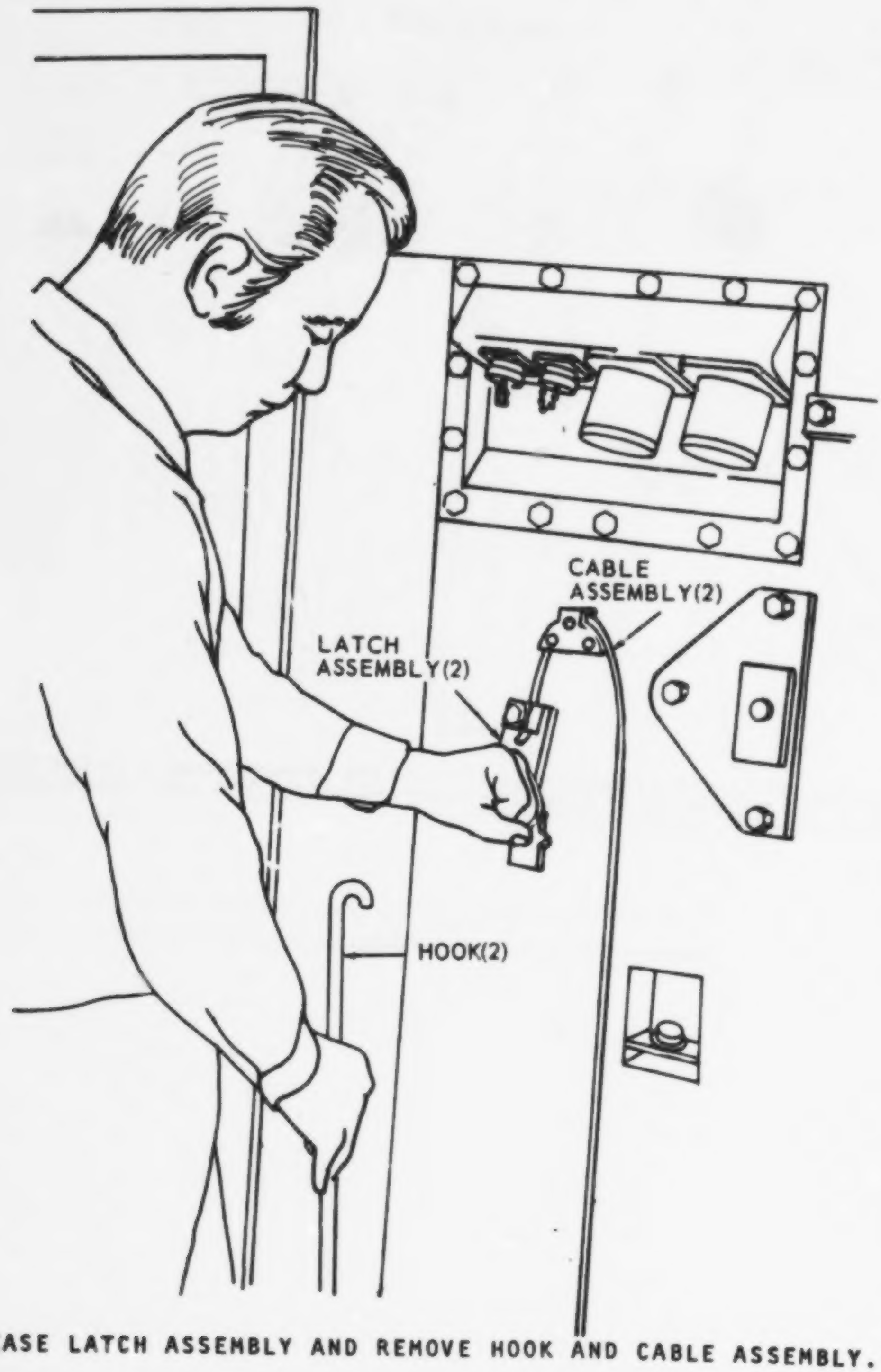
Figure 4-6. Erection of Expandable Shelter (Sheet 2 of 36) (TS 013705)


FOLDING ROOF
SUPPORT ASSEMBLY(2)
FOLDING FLOOR

WARNING: ENSURE LATCHES SECURING FOLDING FLOOR ARE ENGAGED PRIOR TO LIFTING FOLDING ROOF EXTEND SUPPORT ASSEMBLIES TO REQUIRED LENGTH AND INSTALL PINS. LIFT FOLDING ROOF AND POSITION SUPPORT ASSEMBLIES TO SUPPORT ROOF

TS013706

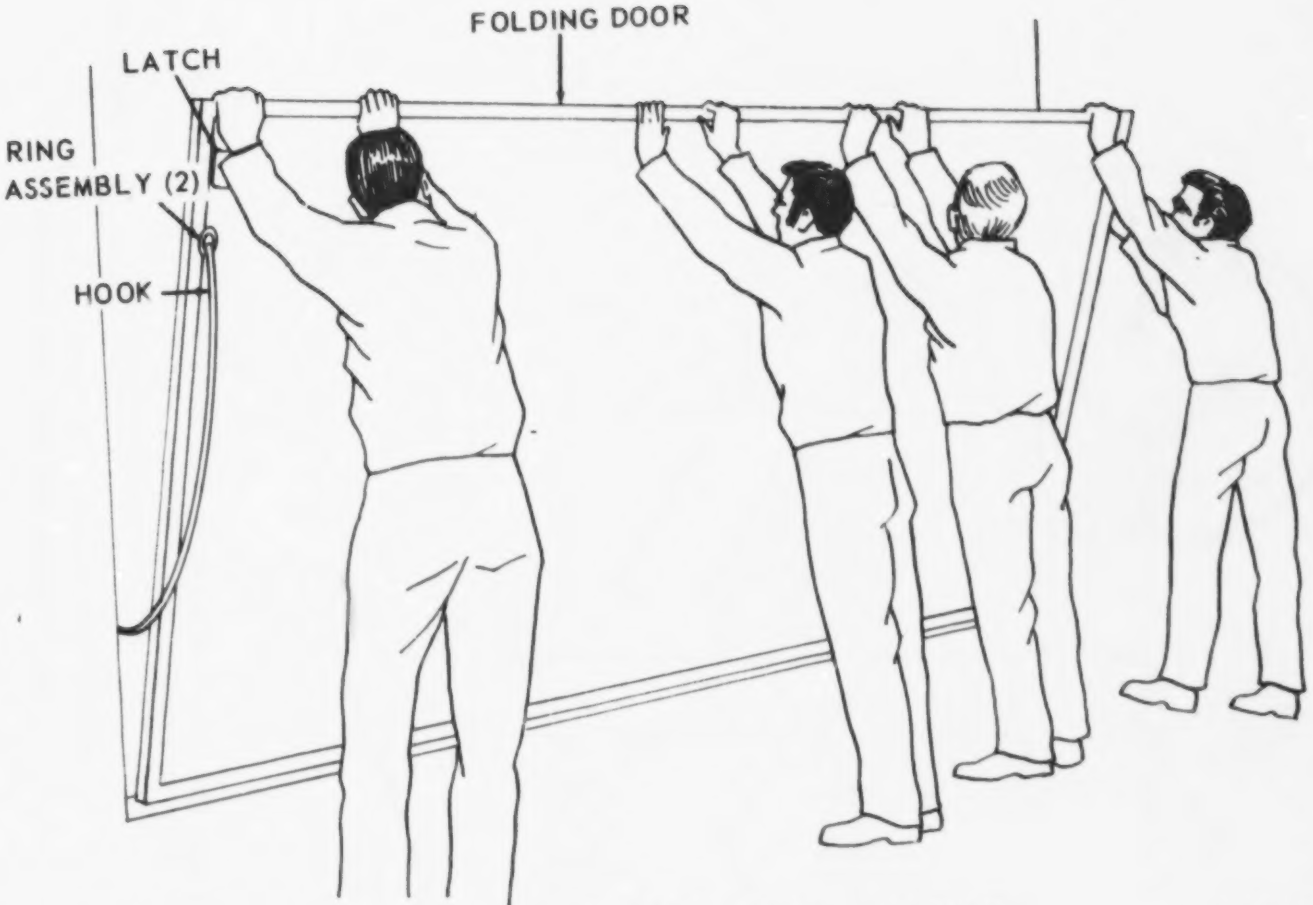
Figure 4-6. Erection of Expandable Shelter (Sheet 3 of 36) (TS 013706)


CABLE ASSEMBLY(2)
LATCH ASSEMBLY(2)
HOOK(2)

RELEASE LATCH ASSEMBLY AND REMOVE HOOK AND CABLE ASSEMBLY.

TS013707

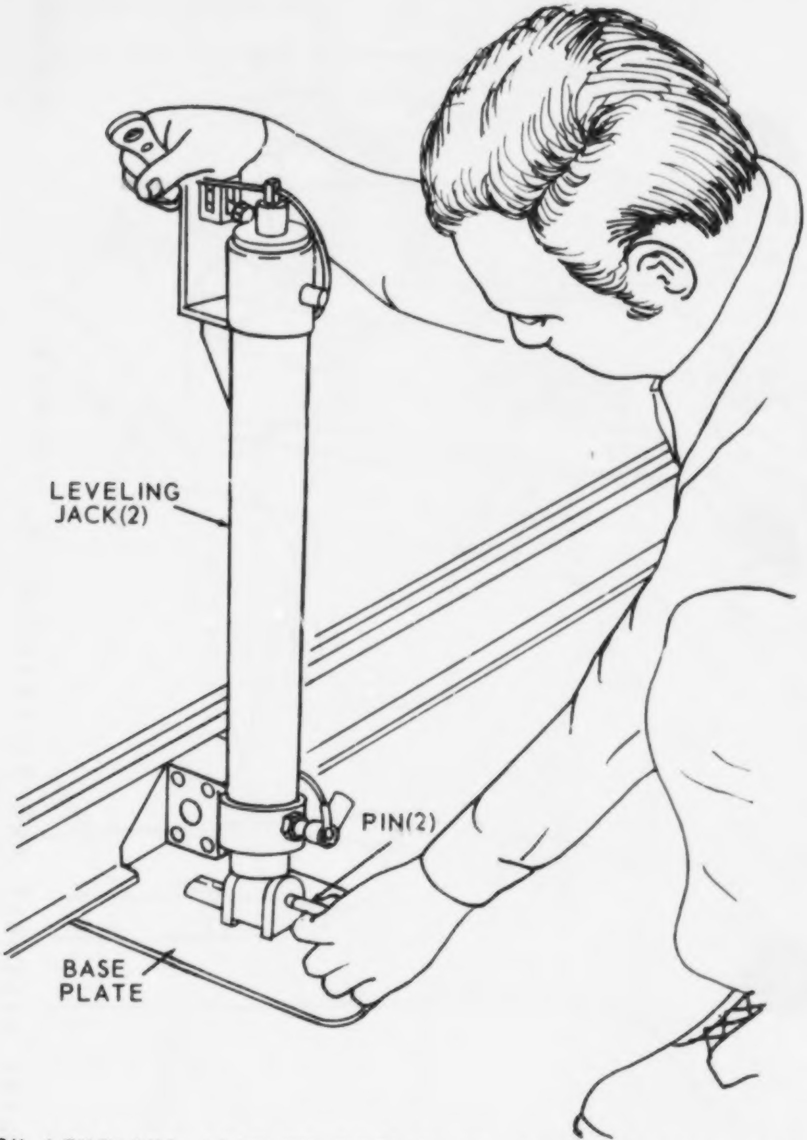
Figure 4-6. Erection of Expandable Shelter (Sheet 4 of 36) (TS 013707)


FOLDING DOOR
LATCH
RING ASSEMBLY (2)
HOOK

TS 013708

ATTACH HOOK TO RING ASSEMBLY AND RELEASE LATCH. SLOWLY LOWER FOLDING FLOOR INTO POSITION.

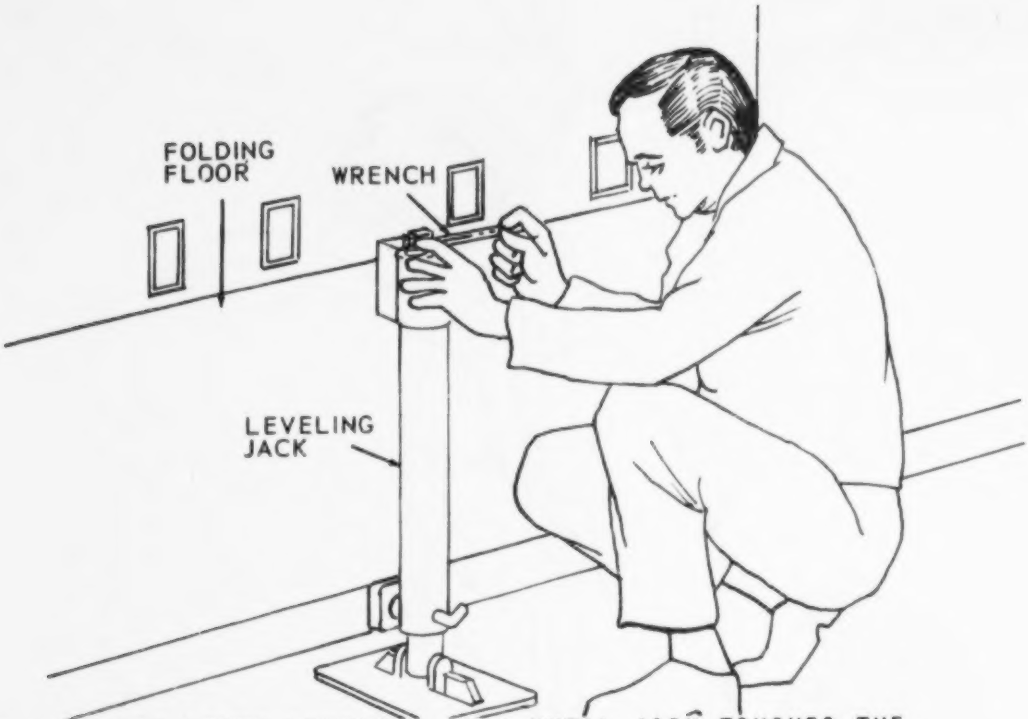
Figure 4-6. Erection of Expandable Shelter (Sheet 5 of 36) (TS 013708)


LEVELING JACK(2)
PIN(2)
BASE PLATE

ATTACH LEVELING JACK TO BASE PLATE WITH PIN AND POSITION LEVELING JACK UPRIGHT.

TS013709

Figure 4-6. Erection of Expandable Shelter (Sheet 6 of 36) (TS 013709)


FOLDING FLOOR
WRENCH
LEVELING JACK

USING A WRENCH LOWER LEVELING JACK UNTIL JACK TOUCHES THE GROUND AND SUPPORTS THE FOLDING FLOOR. DO NOT LIFT FOLDING FLOOR WITH LEVELING JACKS UNTIL SHELTER HAS BEEN COMPLETELY EXPANDED.

TS013710

Figure 4-6. Erection of Expandable Shelter (Sheet 7 of 36) (TS 013710)

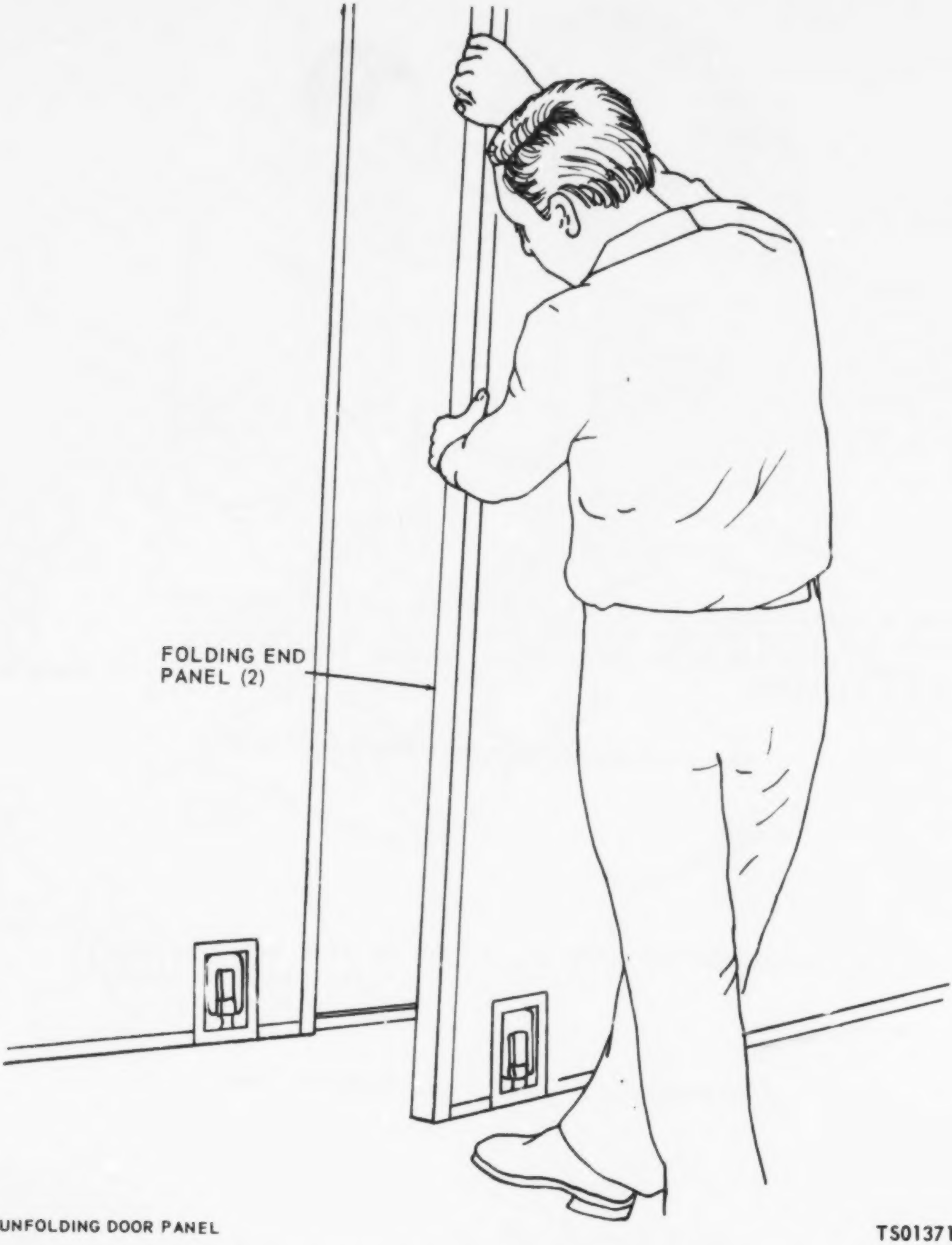
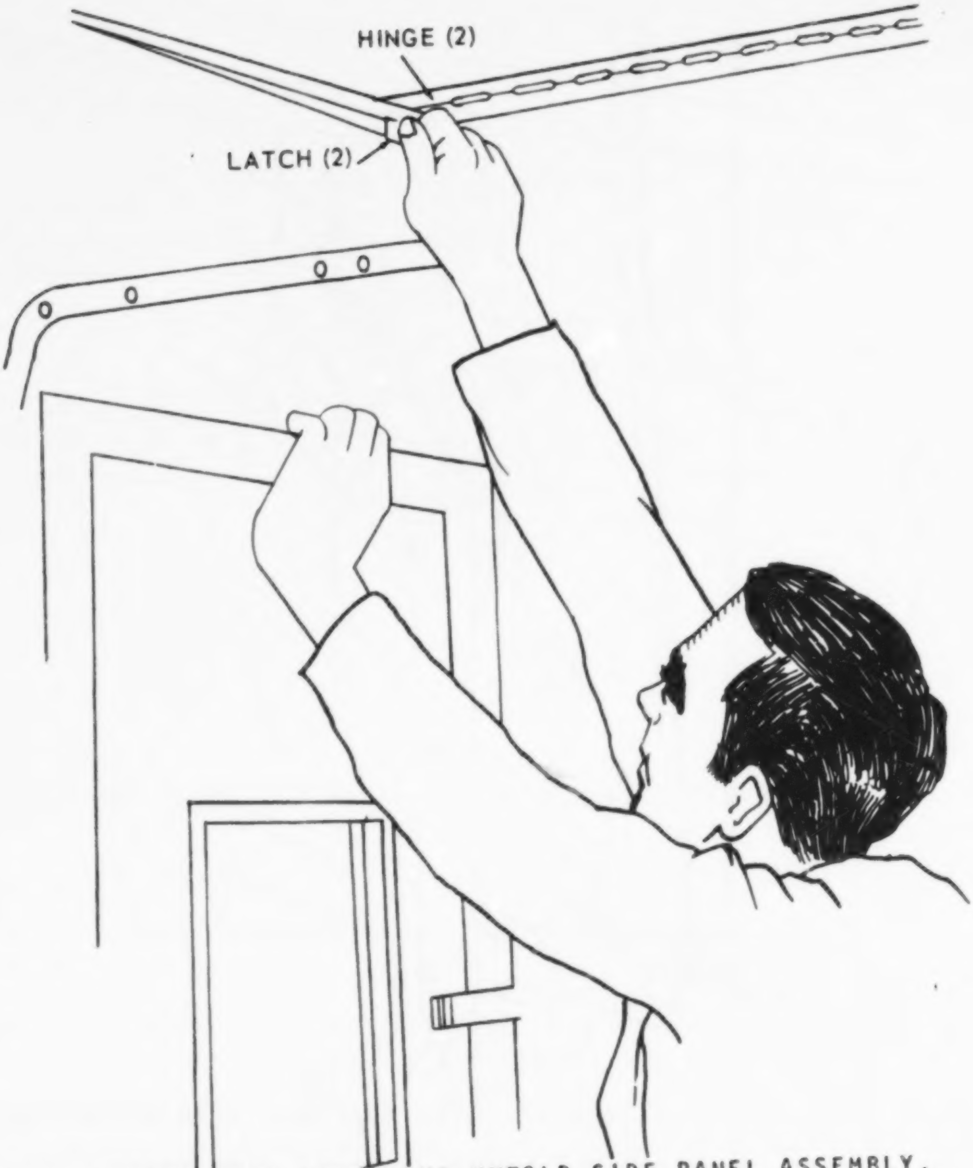

FOLDING END PANEL (2)
UNFOLDING DOOR PANEL
TS01371

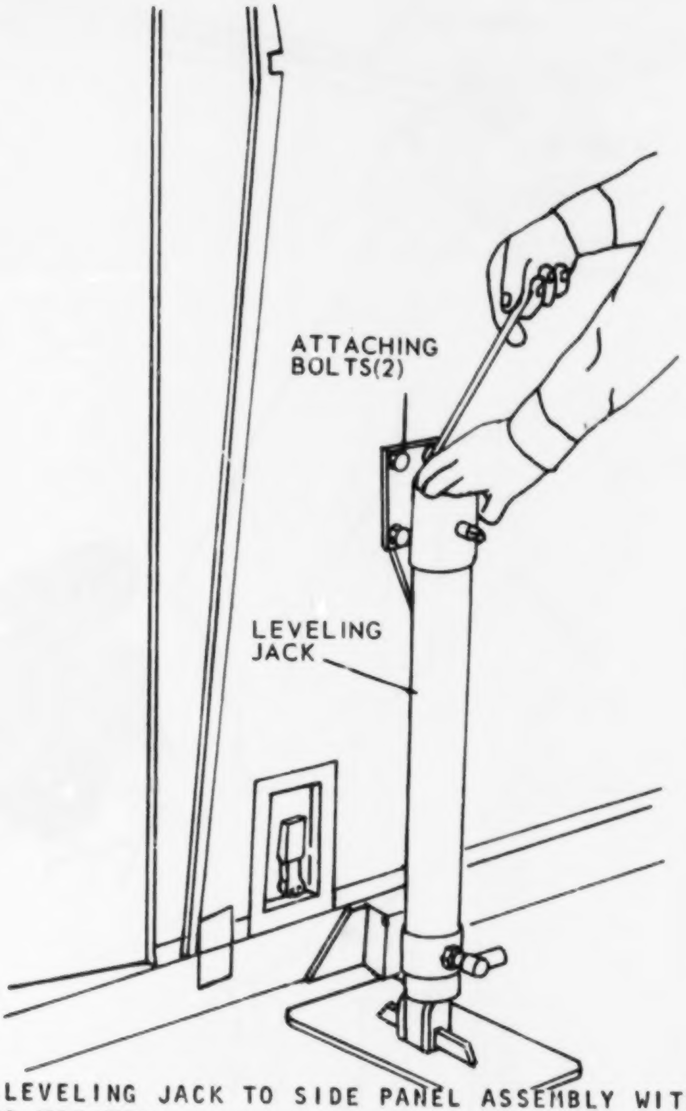
Figure 4-6. Erection of Expandable Shelter (Sheet 8 of 36) (TS 013711)



DISCONNECT LATCH FROM HINGE AND UNFOLD SIDE PANEL ASSEMBLY.
NOTE: PROCEDURE ALSO APPLIES TO ADJACENT SIDE PANEL ASSEMBLY.

TS013712

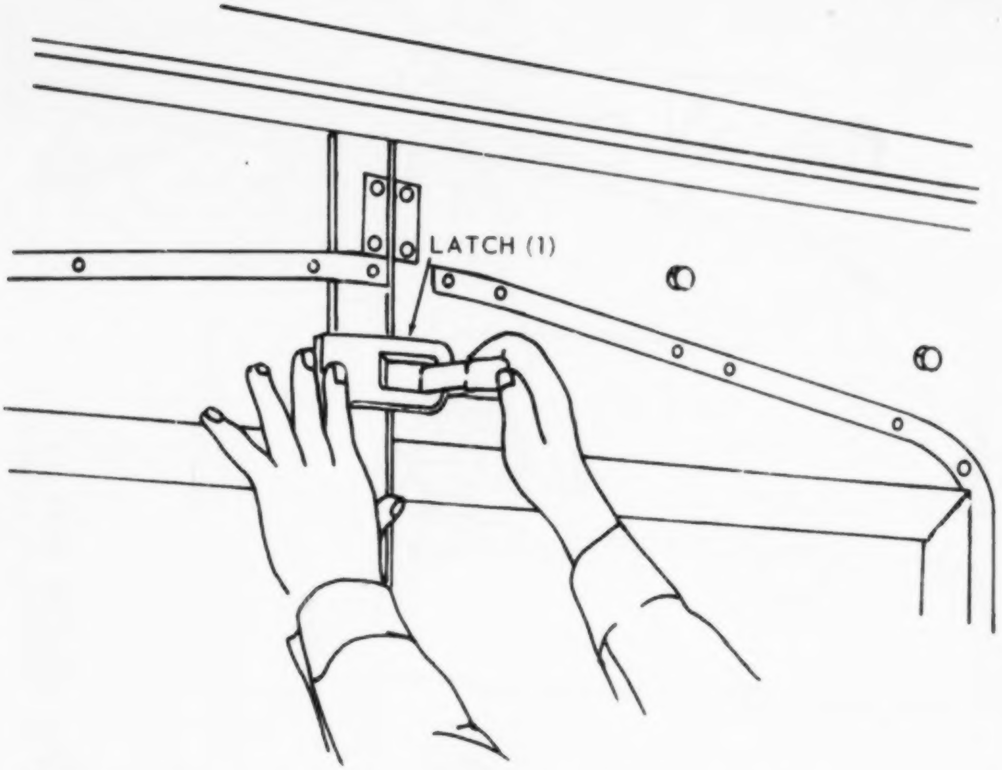
Figure 4-6. Erection of Expandable Shelter (Sheet 9 of 36) (TS 013712)


ATTACHING BOLTS(2)
LEVELING JACK

SECURE LEVELING JACK TO SIDE PANEL ASSEMBLY WITH ATTACHING BOLT AND TIGHTEN.
NOTE: PROCEDURE ALSO APPLIES TO ADJACENT SIDE PANEL.

TS013713

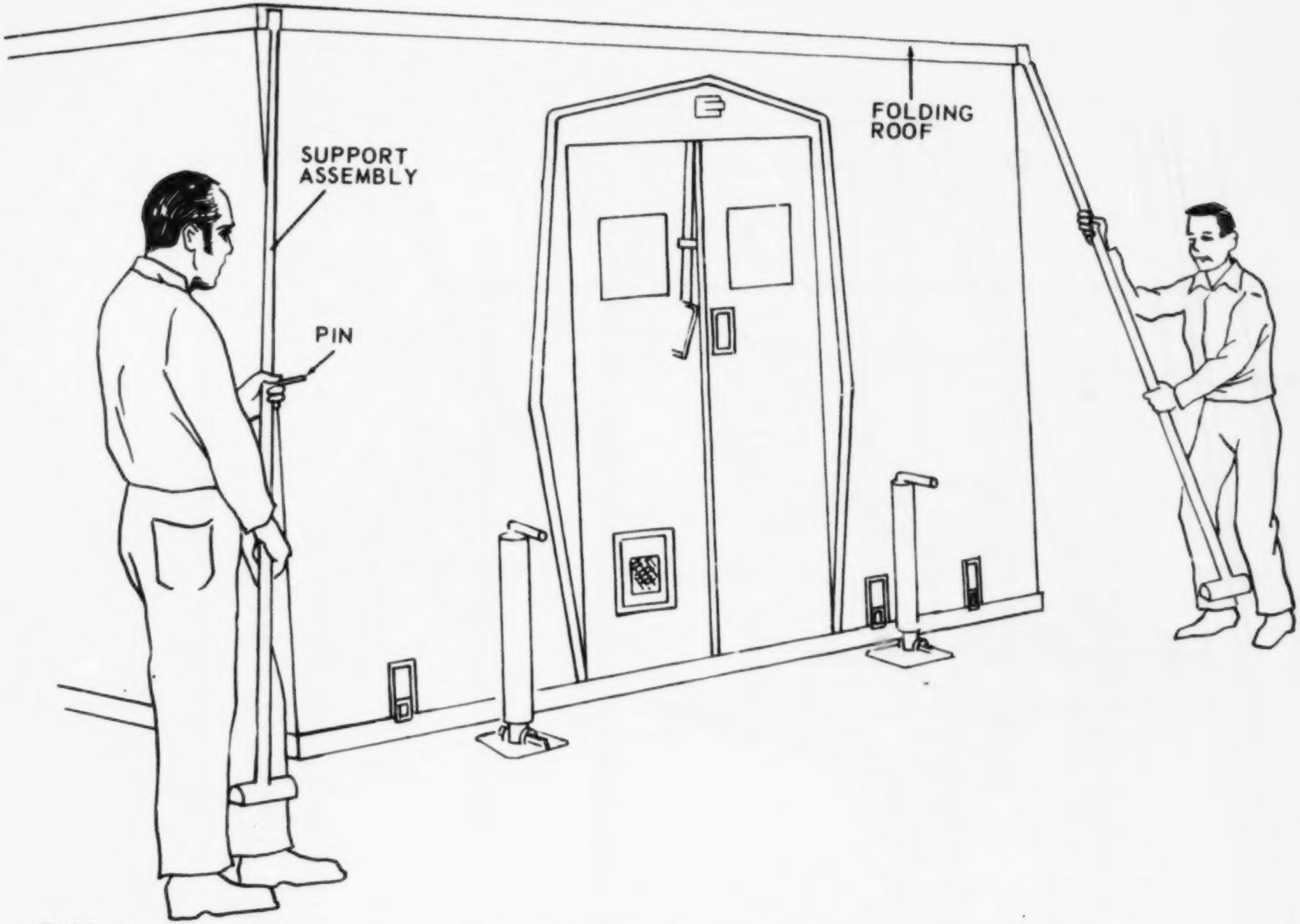
Figure 4-6. Erection of Expandable Shelter (Sheet 10 of 36) (TS 013713)



SECURE SIDE PANEL ASSEMBLIES TOGETHER WITH LATCH.

TS013714

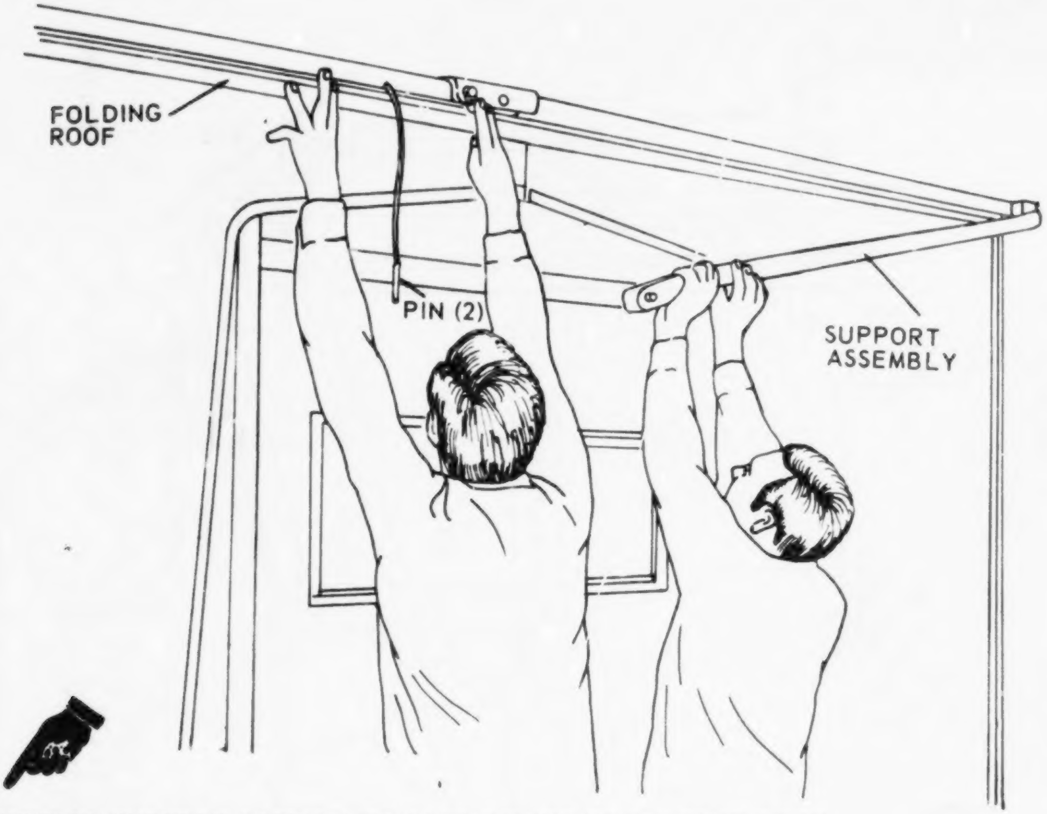
Figure 4-6. Erection of Expandable Shelter (Sheet 11 of 36) (TS 013714)


SUPPORT ASSEMBLY
PIN
FOLDING ROOF

PULL SUPPORT ASSEMBLIES OUTWORD AND ALLOW FOLDING ROOF TO REST ON SHELTER. REMOVE PIN AND COLLAPSE SUPPORT ASSEMBLY. REINSTALL PIN.

TS013715

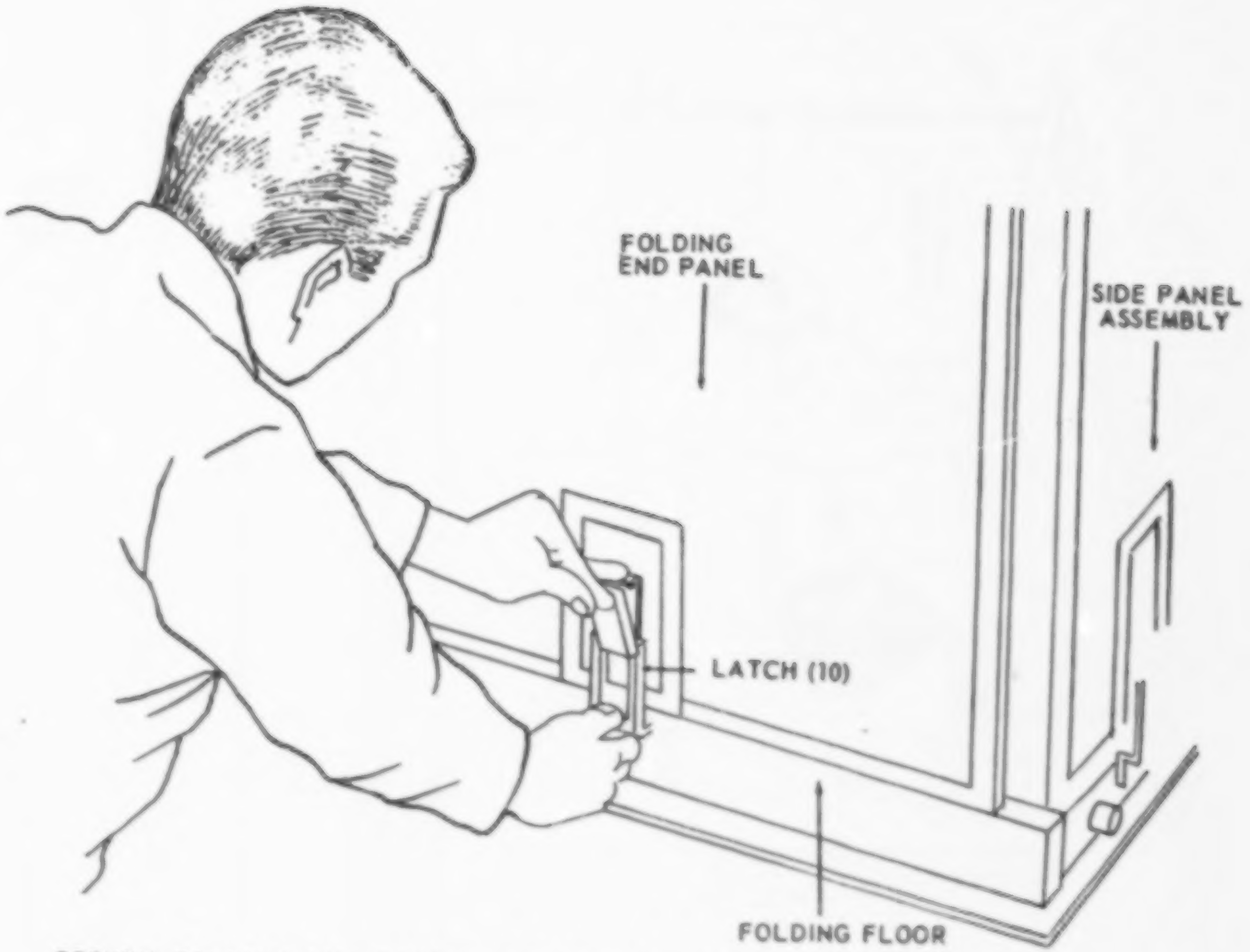
Figure 4-6. Erection of Expandable Shelter (Sheet 12 of 36) (TS 013715)


FOLDING ROOF
PIN (2)
SUPPORT ASSEMBLY

POSITION SUPPORT ASSEMBLIES ALONG EDGE OF FOLDING ROOF AND SECURE WITH PINS.
ON SHELTER SERIAL NO. 185 THRU 302 ONLY, UN-PIN SUPPORT ASSEMBLIES FROM FOLDING ROOF AND STORE INSIDE THE SHELTER.

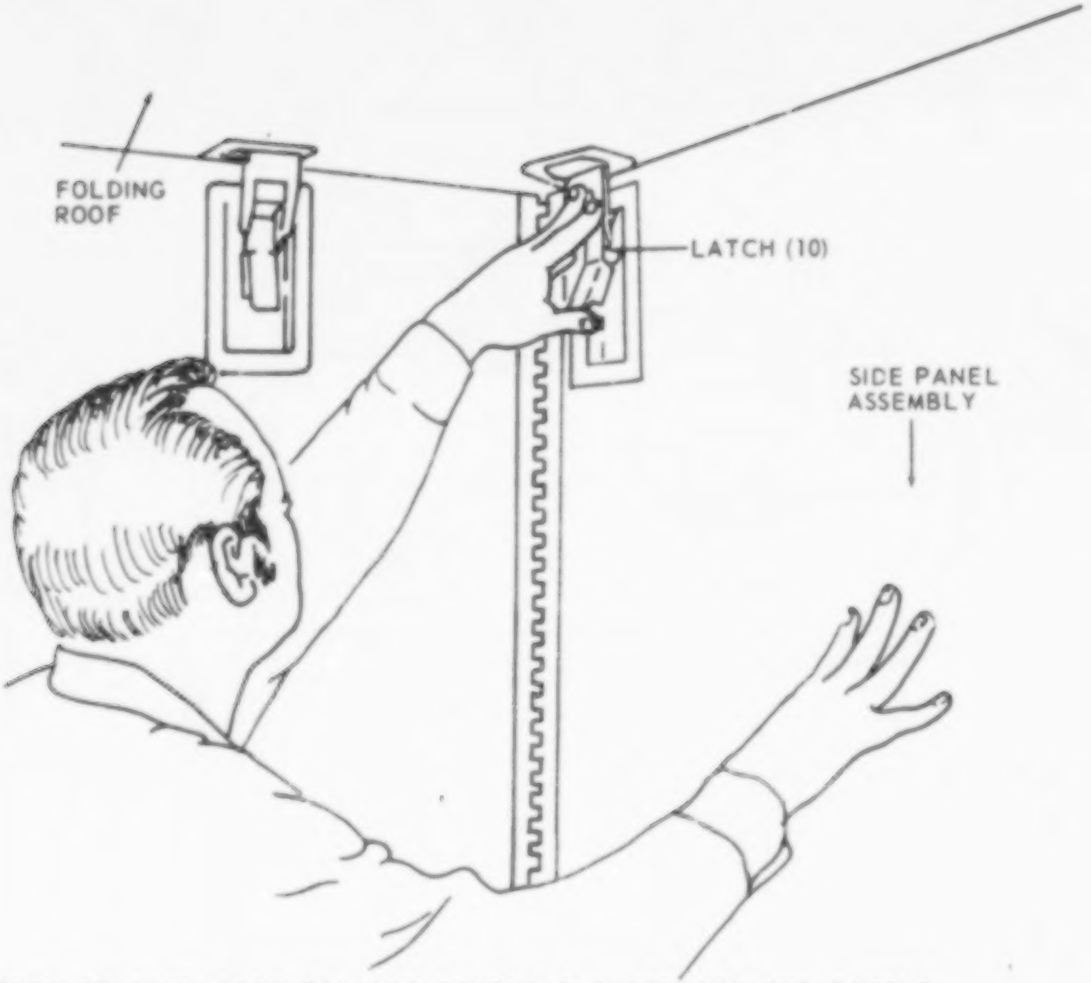
TS013716

Figure 4-6. Erection of Expandable Shelter (Sheet 13 of 36)(TS 013716)


FOLDING END PANEL
SIDE PANEL ASSEMBLY
LATCH (10)
FOLDING FLOOR
TS013717

SECURE FOLDING END PANELS AND SIDES PANEL ASSEMBLIES TO FOLDING FLOOR WITH LATCHES (10 PLACES). LEVEL FOLDING WITH LEVELING JACKS AS SHOWN IN SHEET 7.

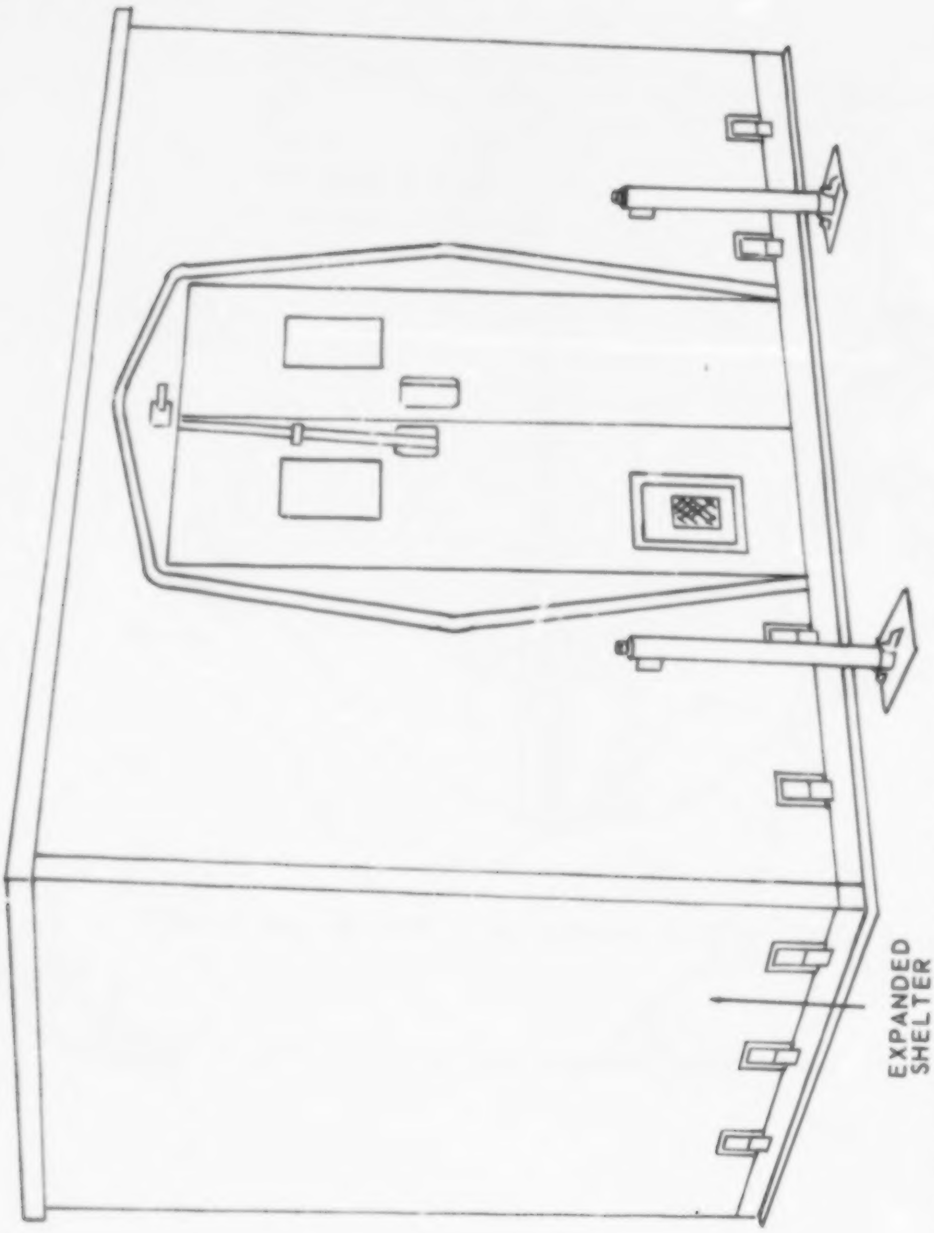
Figure 4-2. Erection of Expandable Shelter (Sheet 16 of 36) (TS 013717)


FOLDING ROOF
LATCH (10)
SIDE PANEL ASSEMBLY

SECURE FOLDING ROOF TO SIDE PANELS AND FOLDING END PANELS WITH LATCHES (10 PLACES).

TS013718

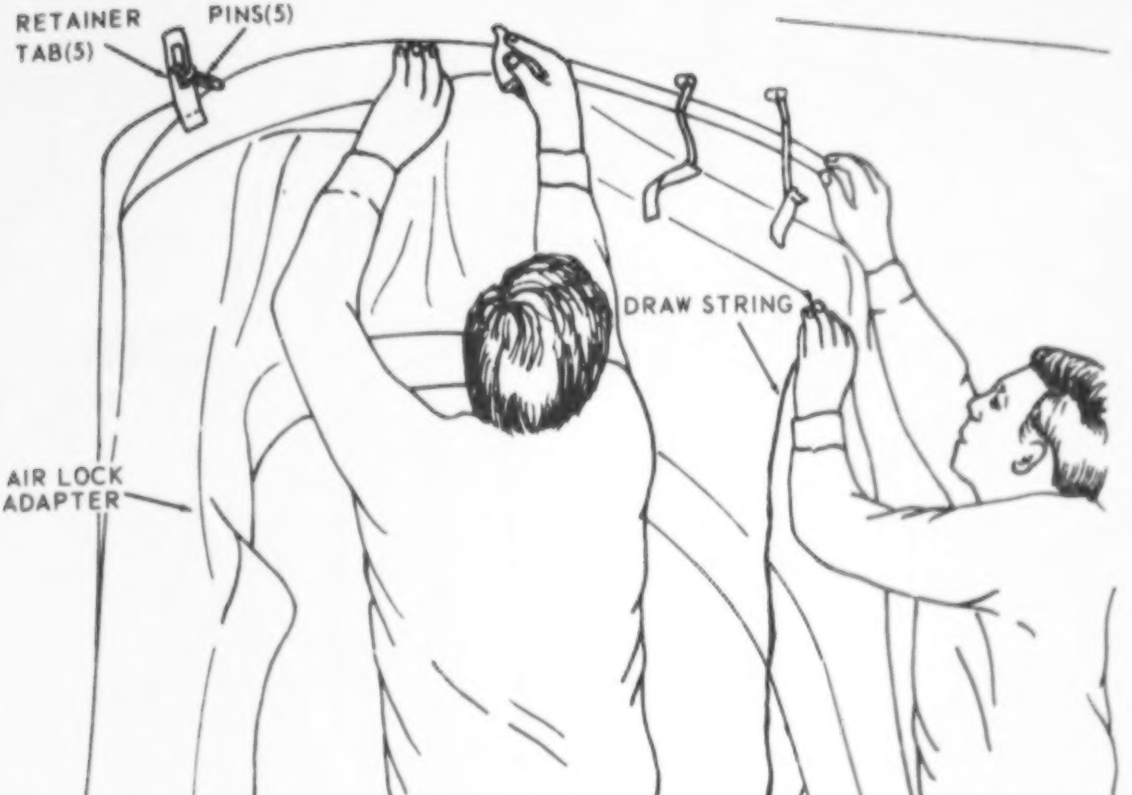
Figure 4-6. Erection of Expandable Shelter (Sheet 15 of 36) (TS 013718)


EXPANDED
SHELTER

ENSURE FLOORS ARE LEVEL AND ALL LATCHES ARE SECURED.

TS013719

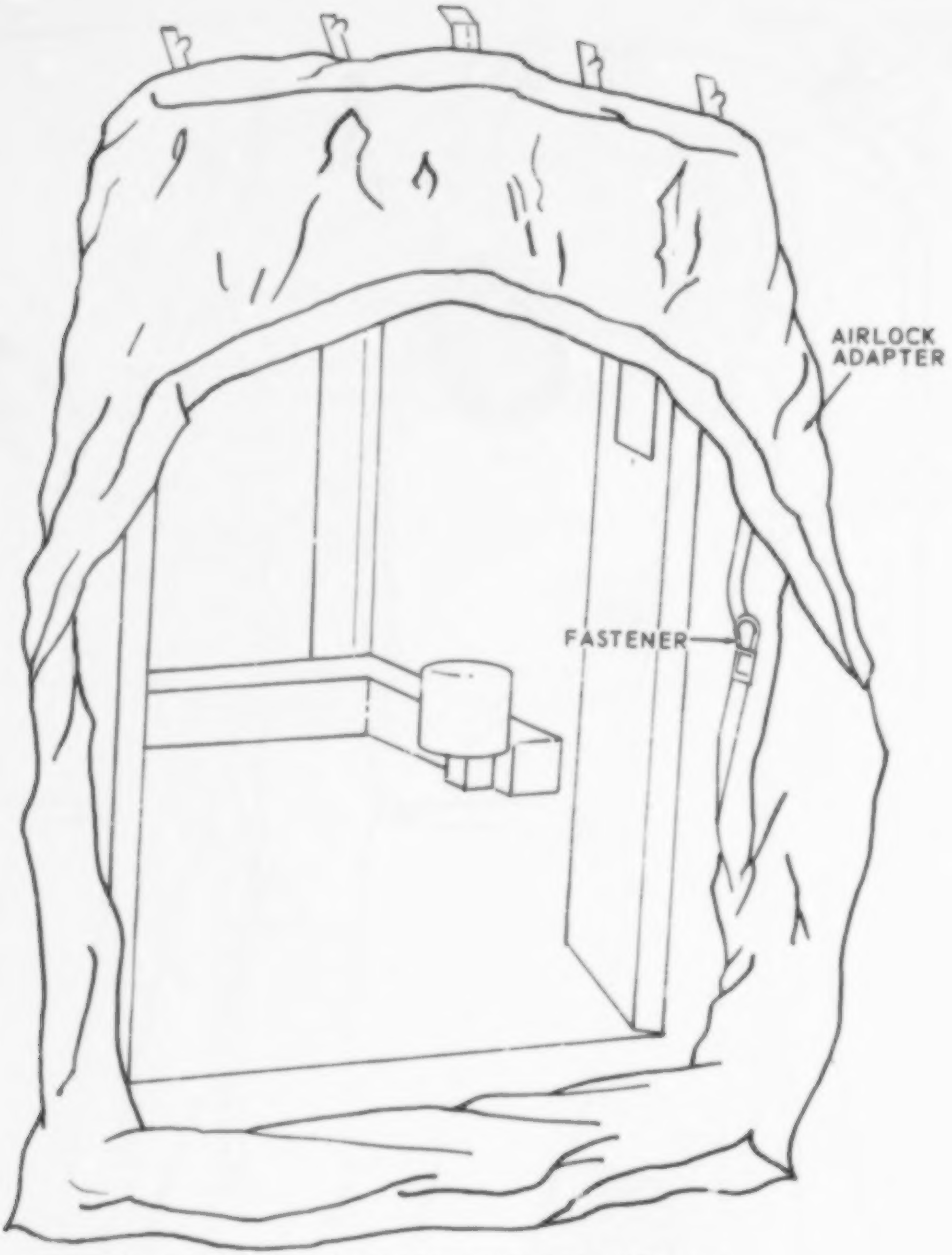
Figure 4-6. Erection of Expandable Shelter (Sheet 16 of 36) (TS 013719)


RETAINER TAB(5)
PINS(5)
AIR LOCK ADAPTER
DRAW STRING
FASTENER

PRESS AIRLOCK ADAPTER INTO RECEPTACLE AND SECURE WITH FASTENERS. PULL DRAWSTRING TIGHT AND HOOK TO RECEPTACLE.

TS013720

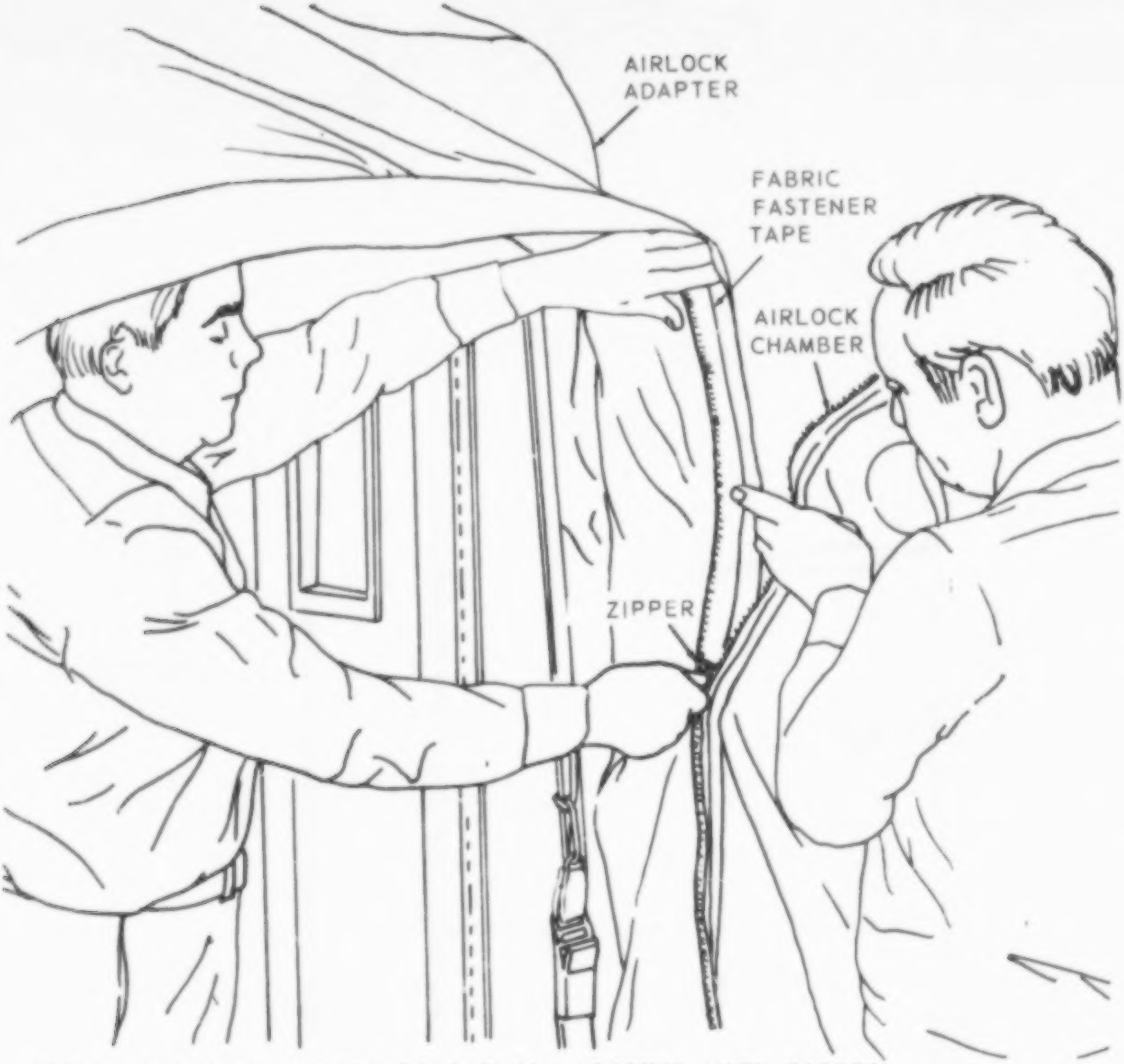
Figure 4-6. Erection of Expandable Shelter (Sheet 17 of 36) (TS 013720)


AIRLOCK ADAPTER
FASTENER

AIRLOCK ADAPTER IS SECURED IN PLACE WITH ALL FASTENERS.

TS013721

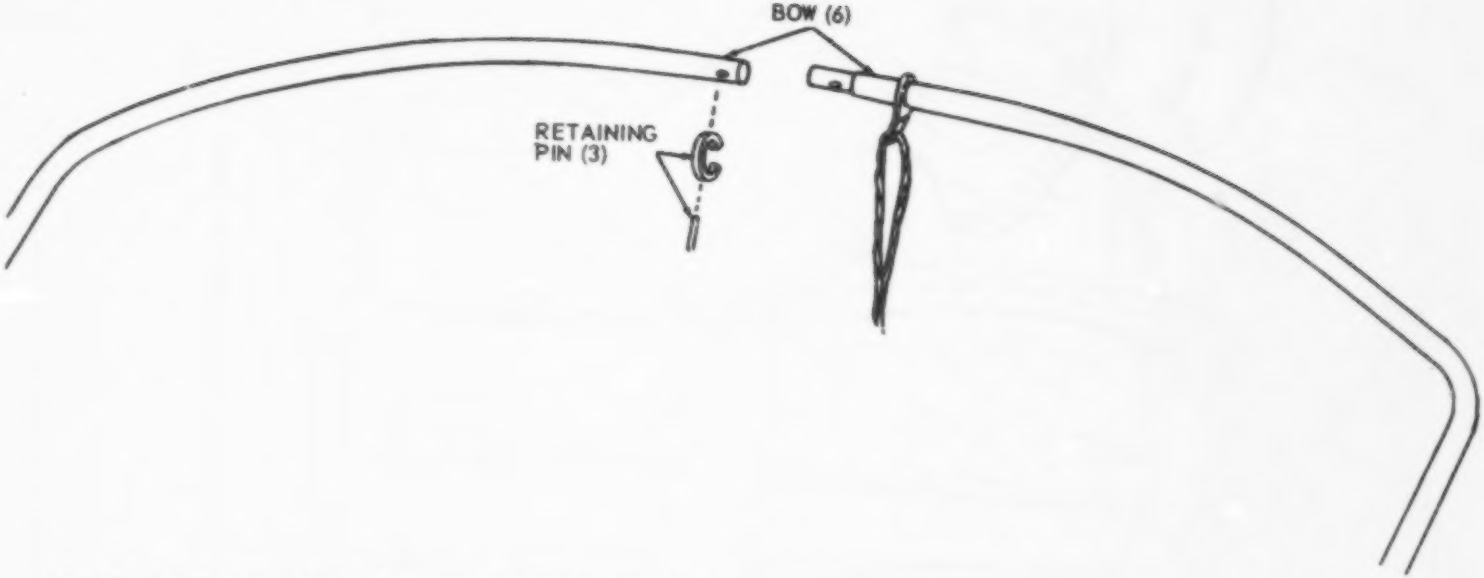
Figure 4-6. Erection of Expandable Shelter (Sheet 18 of 36) (TS 013721)


AIRLOCK ADAPTER
FABRIC FASTENER TAPE
AIRLOCK CHAMBER
ZIPPER

ATTACH AIRLOCK CHAMBER TO AIRLOCK ADAPTER WITH ZIPPER.
SEAL MATING AREA WITH FABRIC FASTENER TAPE.

TS013722

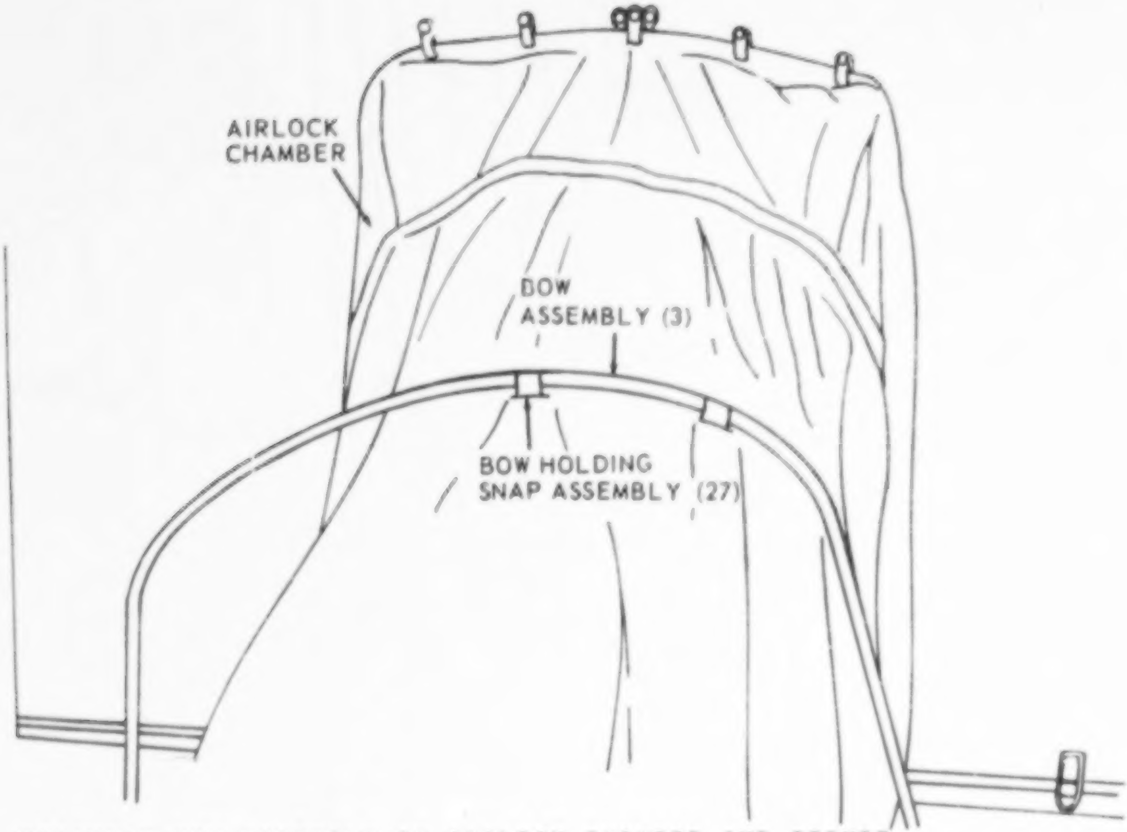
Figure 4-6. Erection of Expandable Shelter (Sheet 19 of 36) (TS 013722)


BOW (6)
RETAINING PIN (3)

ATTACH THE TUBES OF THE BOW ASSEMBLIES AND SECURE WITH RETAINING RINGS.

TS013723

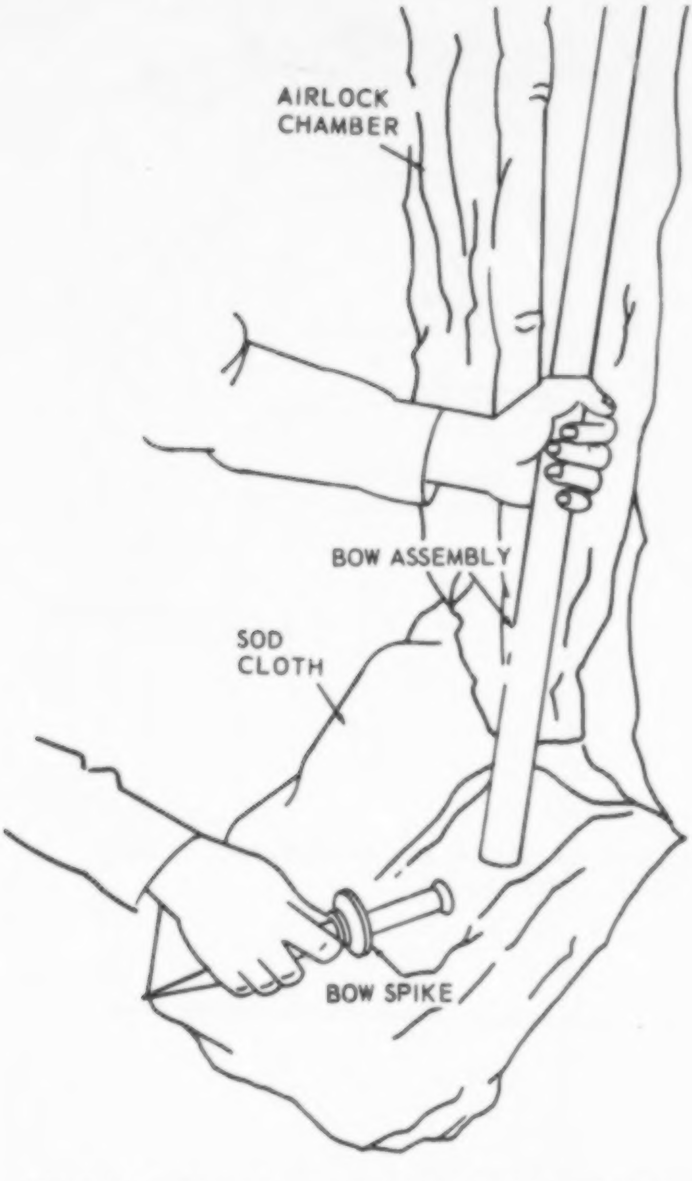
Figure 4-6. Erection of Expandable Shelter (Sheet 20 of 36) (TS 013723)


AIRLOCK CHAMBER
BOW ASSEMBLY (3)
BOW HOLDING SNAP ASSEMBLY (27)

POSITION BOW ASSEMBLY ON AIRLOCK CHAMBER AND SECURE WITH BOW HOLDING SNAP ASSEMBLIES.

TS013724

Figure 4-6. Erection of Expandable Shelter (Sheet 21 of 36) (TS 013724)

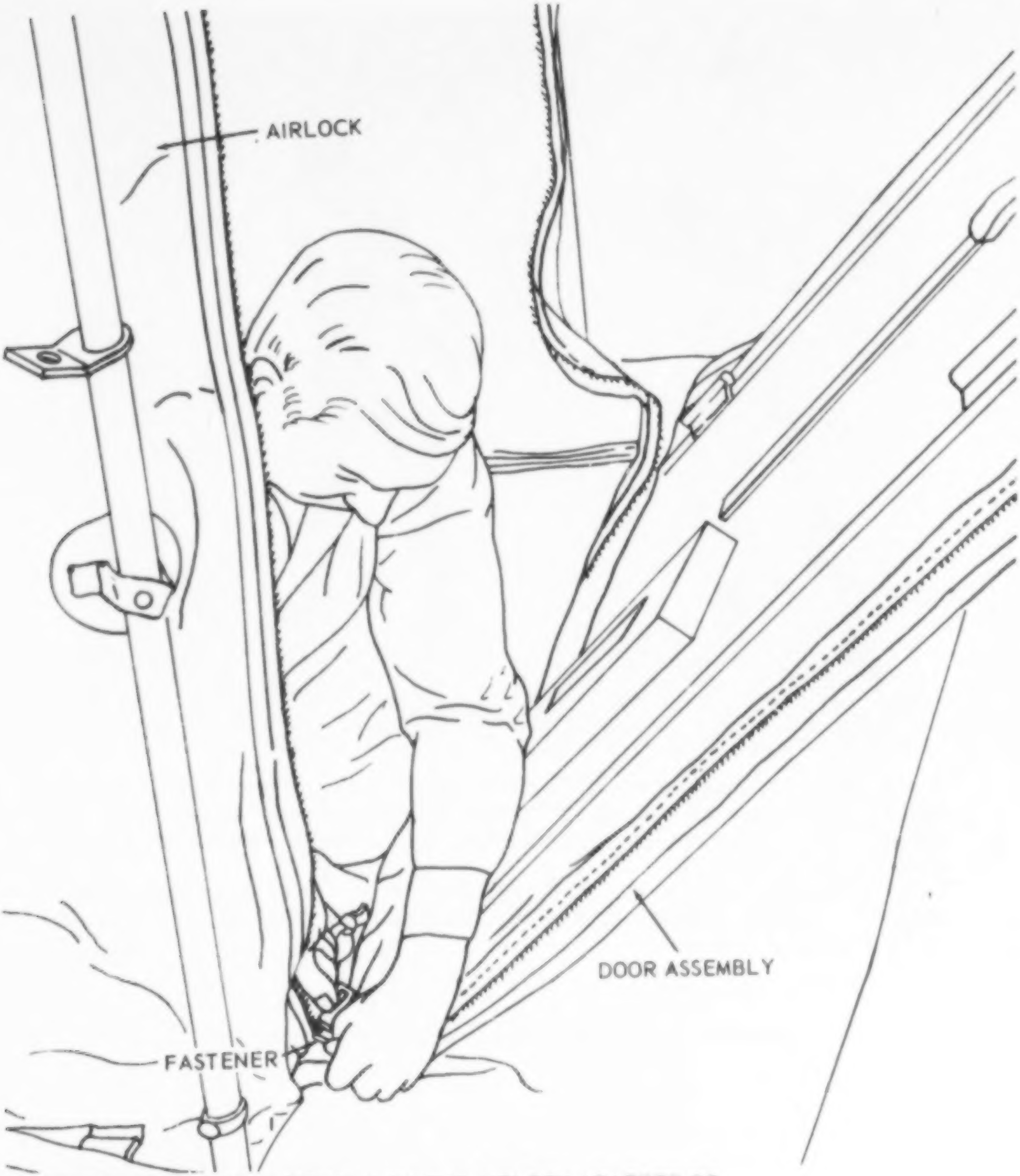


AIRLOCK CHAMBER
BOW ASSEMBLY
SOD CLOTH
BOW SPIKE

POSITION THE BOW ASSEMBLIES ONTO BOW SPIKES DRIVEN INTO THE GROUND.

TS013725

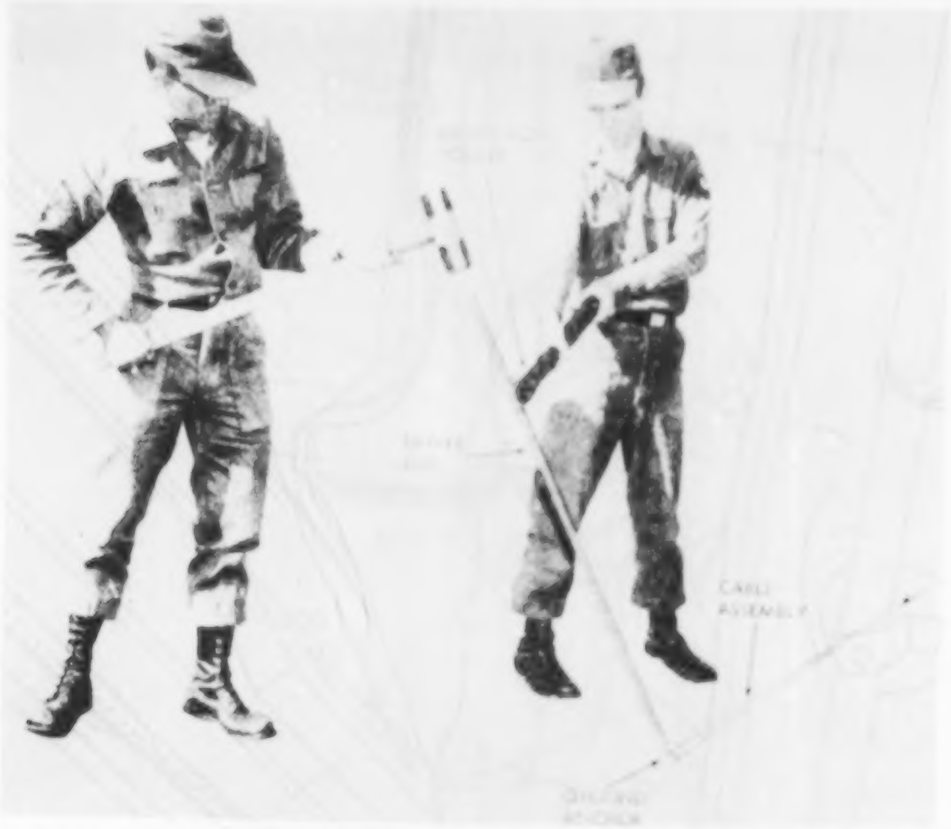
Figure 4-6. Erection of Expandable Shelter (Sheet 22 of 36) (TS 013725)


AIRLOCK
DOOR ASSEMBLY
FASTENER

POSITION THE DOOR ASSEMBLY ON THE AIRLOCK ADAPTER OF MULTIPURPOSE SHELTER AND SECURE WITH FASTENER.

TS013726

Figure 4-6. Erection of Expandable Shelter (Sheet 23 of 36) (TS 013726)



PLACE GROUND ANCHOR IN POSITION WITH CABLE ASSEMBLY INSTALLED. USING DRIVER ROD, DRIVE GROUND ANCHOR APPROXIMATELY TWO FEET BELOW SURFACE. CONNECT GUY LINE ROPE TO CABLE ASSEMBLY AND TIGHTEN ROPE BY PULLING DOWN ON GUY LINE SLIP.

NOTE: ARROWHEAD ANCHORS SHALL BE APPROXIMATELY 33° DEGREES AWAY FROM SHELTER. GROUND ANCHORS, TENT PINS AND BOW PINS SHALL BE UTILIZED TO SECURE AIRLOCK CHAMBER.

TSO13727

Figure 4-6. Erection of Expandable Shelter (Sheet 24 of 36) (TS 013727)

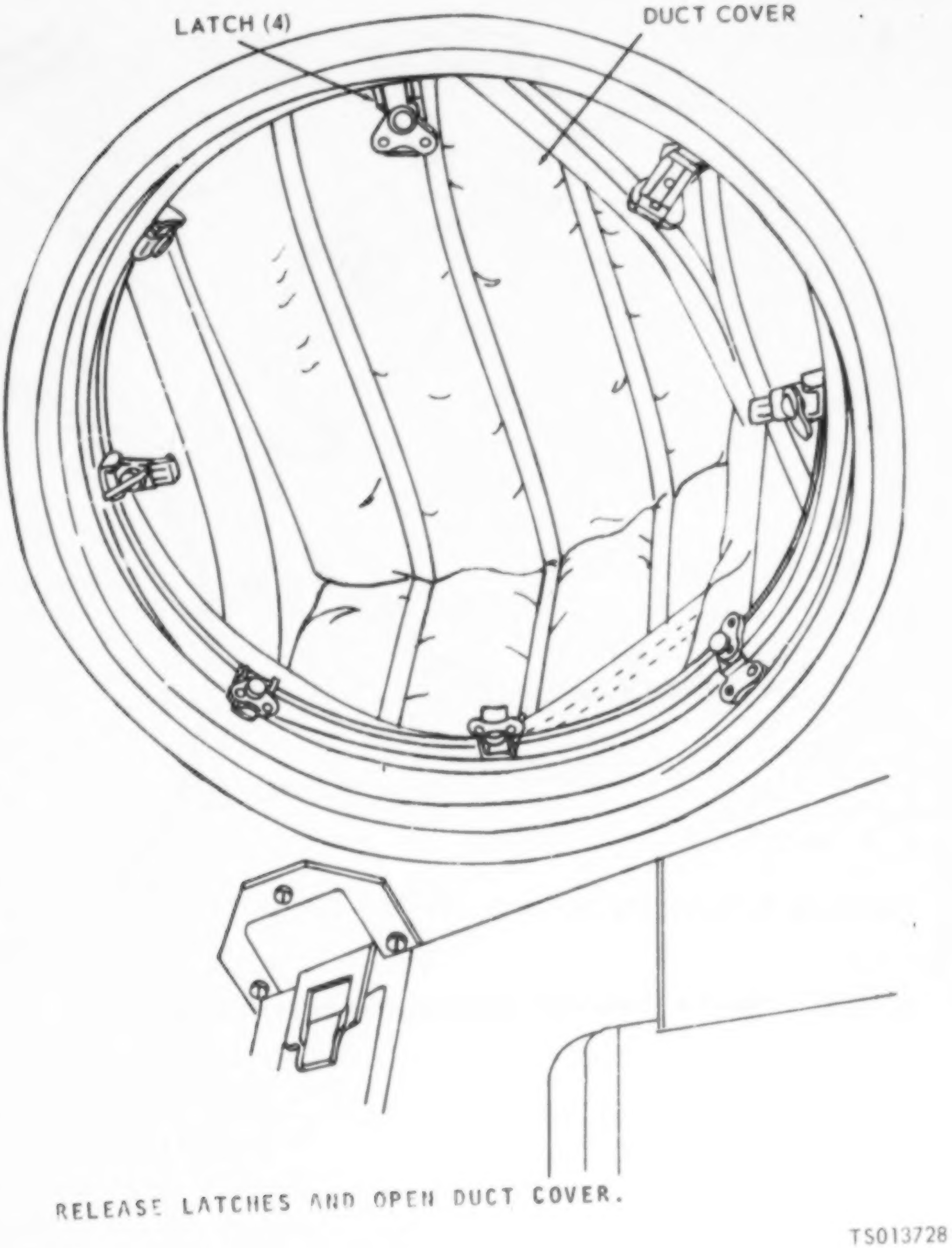
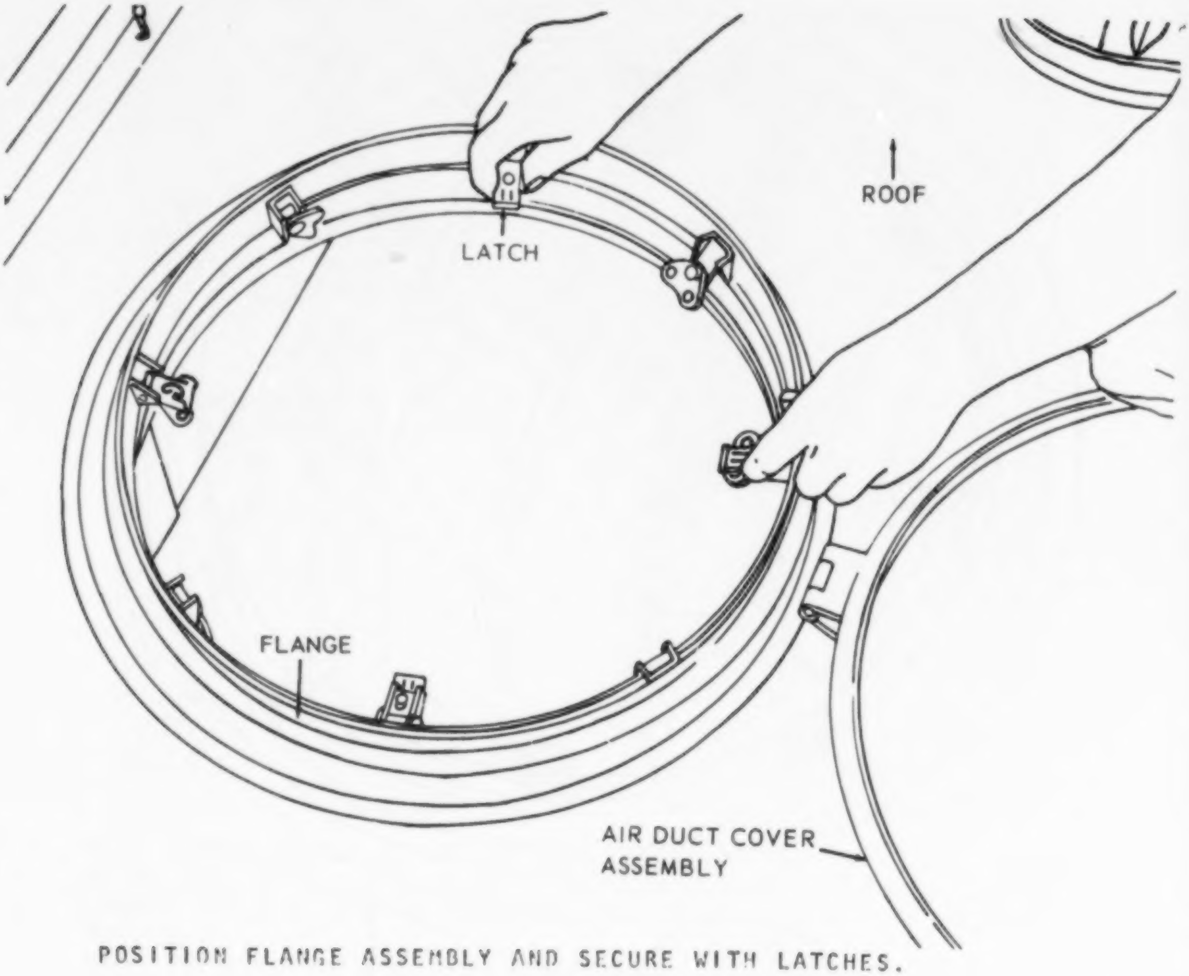

LATCH (4)
DUCT COVER
RELEASE LATCHES AND OPEN DUCT COVER.
TS013728

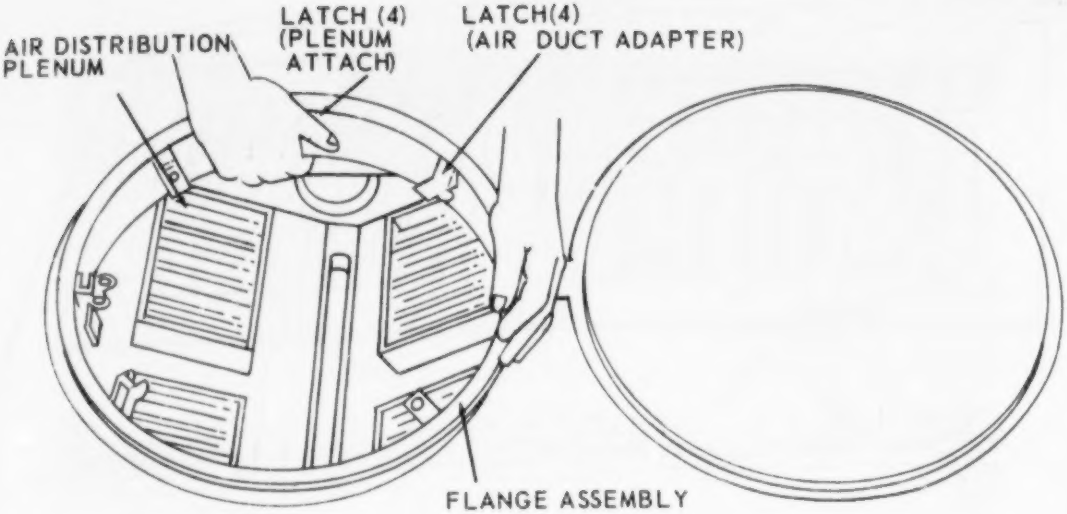
Figure 4-6. Erection of Expandable Shelter (Sheet 25 of 36) (TS 013728)


LATCH
ROOF
FLANGE
AIR DUCT COVER ASSEMBLY

POSITION FLANGE ASSEMBLY AND SECURE WITH LATCHES.

TS013729

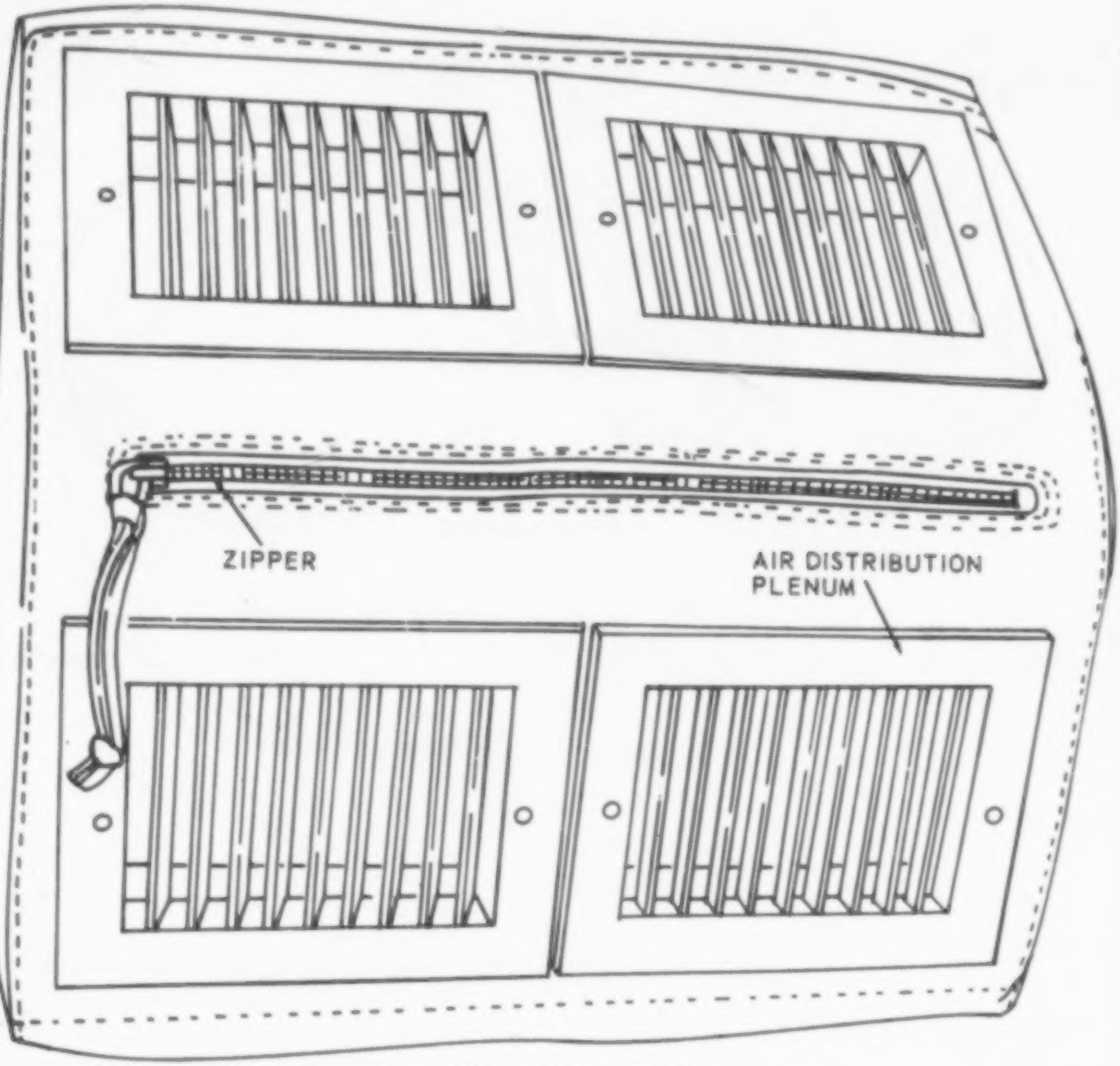
Figure 4-6. Erection of Expandable Shelter (Sheet 26 of 36) (TS 013729)


AIR DISTRIBUTION PLENUM
LATCH (4) (PLENUM ATTACH)
LATCH(4) (AIR DUCT ADAPTER)
FLANGE ASSEMBLY

POSITION AIR DISTRIBUTION PLENUM ON BOTTOM OF FLANGE ASSEMBLY AND SECURE WITH PLENUM LATCHES.

TS013730

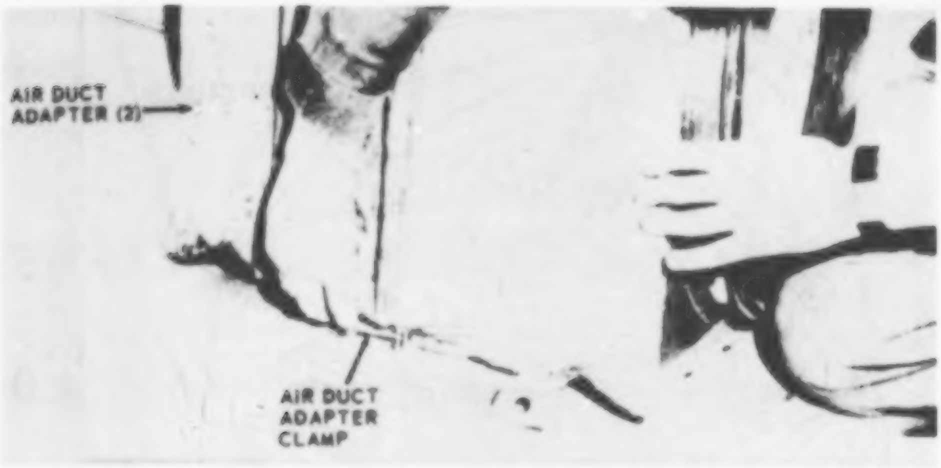
Figure 4-6. Frection of Expandable Shelter (Sheet 27 of 36) (TS 013730)


ZIPPER
AIR DISTRIBUTION PLENUM

OPEN ZIPPER ON AIR DISTRIBUTION PLENUM.

TS013731

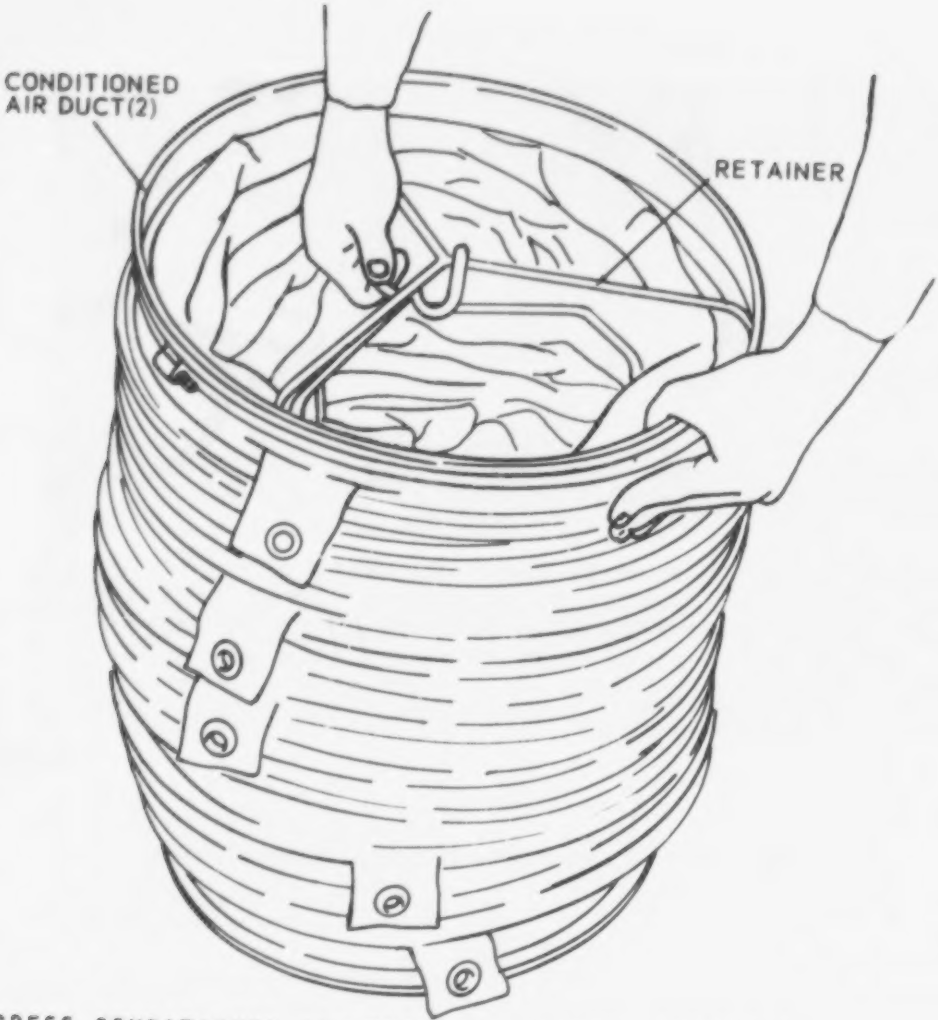
Figure 4-6. Erection of Expandable Shelter (Sheet 28 of 36) (TS 013731)


AIR DUCT ADAPTER (2)
AIR DUCT ADAPTER CLAMP

POSITION AIR DUCT ADAPTER SHOWN IN SHEET 27.
REACH THROUGH AIR DISTRIBUTION PLENUM ZIPPER AREA AND SECURE AIR DUCT ADAPTER WITH LATCHES SHOWN IN SHEET 27. SECURE AIR DUCT ADAPTER TO HANGE WITH AIR DUCT ADAPTER CLAMP.

TS013732

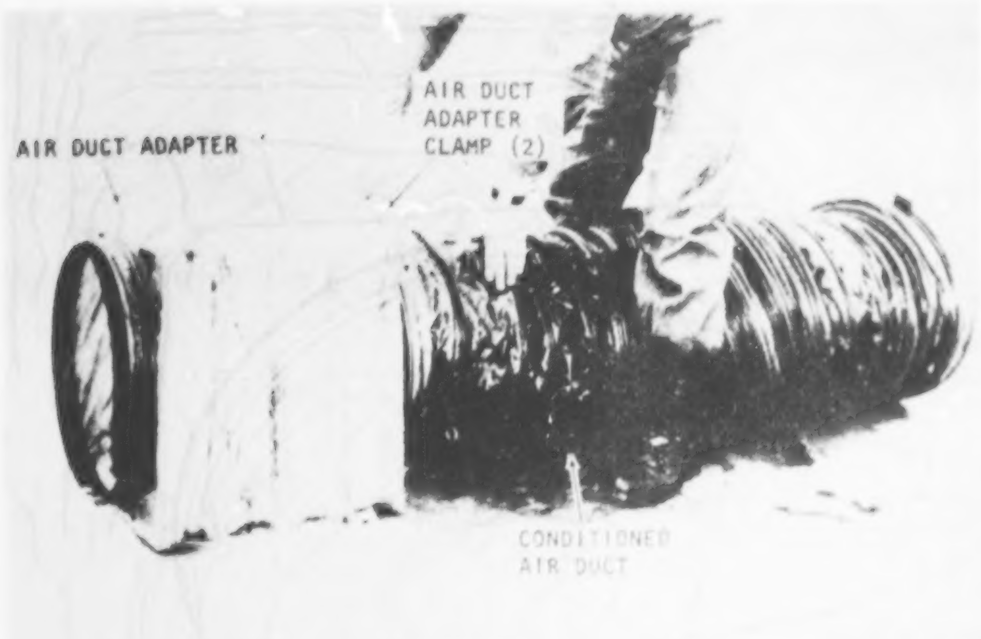
Figure 4-6. Erection of Expandable Shelter (Sheet 29 of 36) (TS 013732)


CONDITIONED
AIR DUCT(2)
RETAINER

COMPRESS CONDITIONED AIR DUCT AND RELEASE RETAINER.

TS013733

Figure 4-6. Erection of Expandable Shelter (Sheet 30 of 36) (TS 013733)

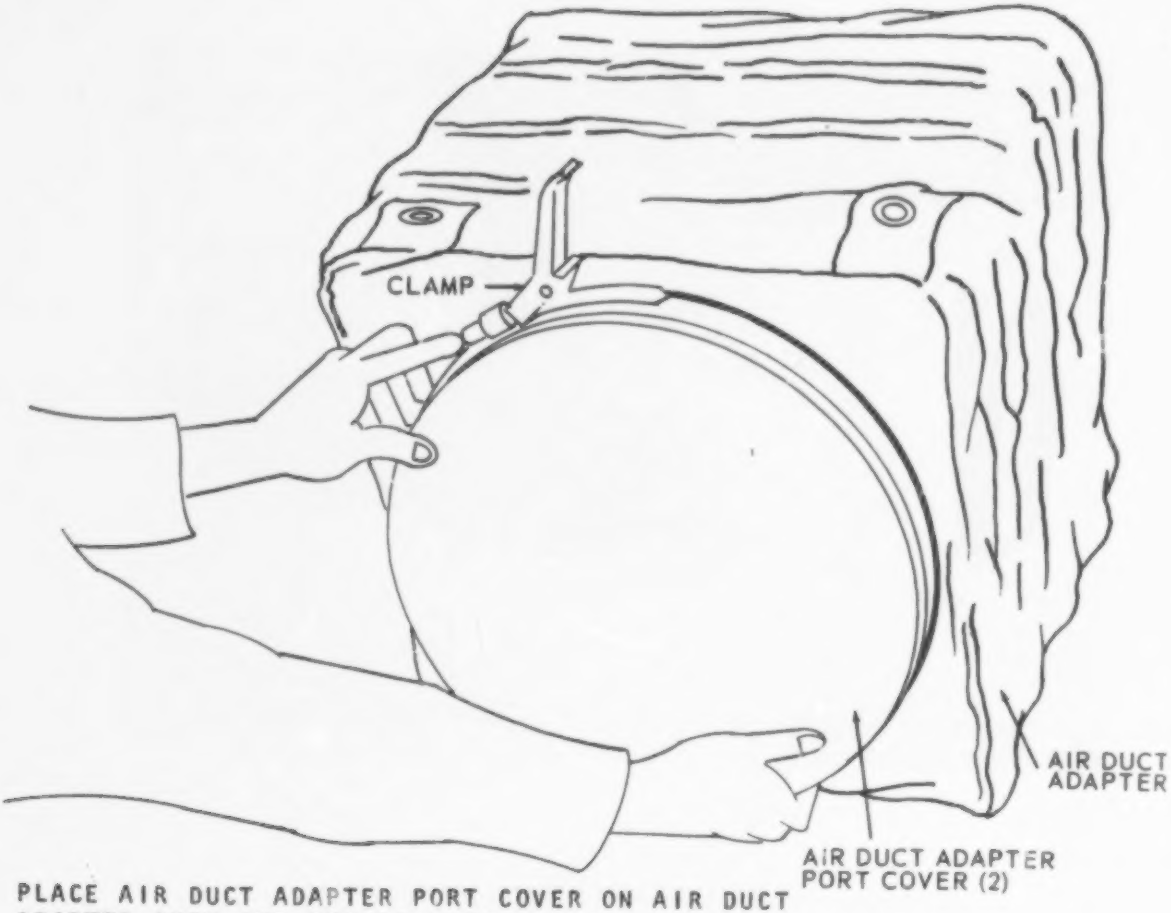


AIR DUCT ADAPTER
AIR DUCT ADAPTER CLAMP (2)
CONDITIONED AIR DUCT

POSITION CONDITIONED AIR DUCT ON AIR DUCT ADAPTERS AND SECURE WITH AIR DUCT ADAPTER CLAMP

TS013734

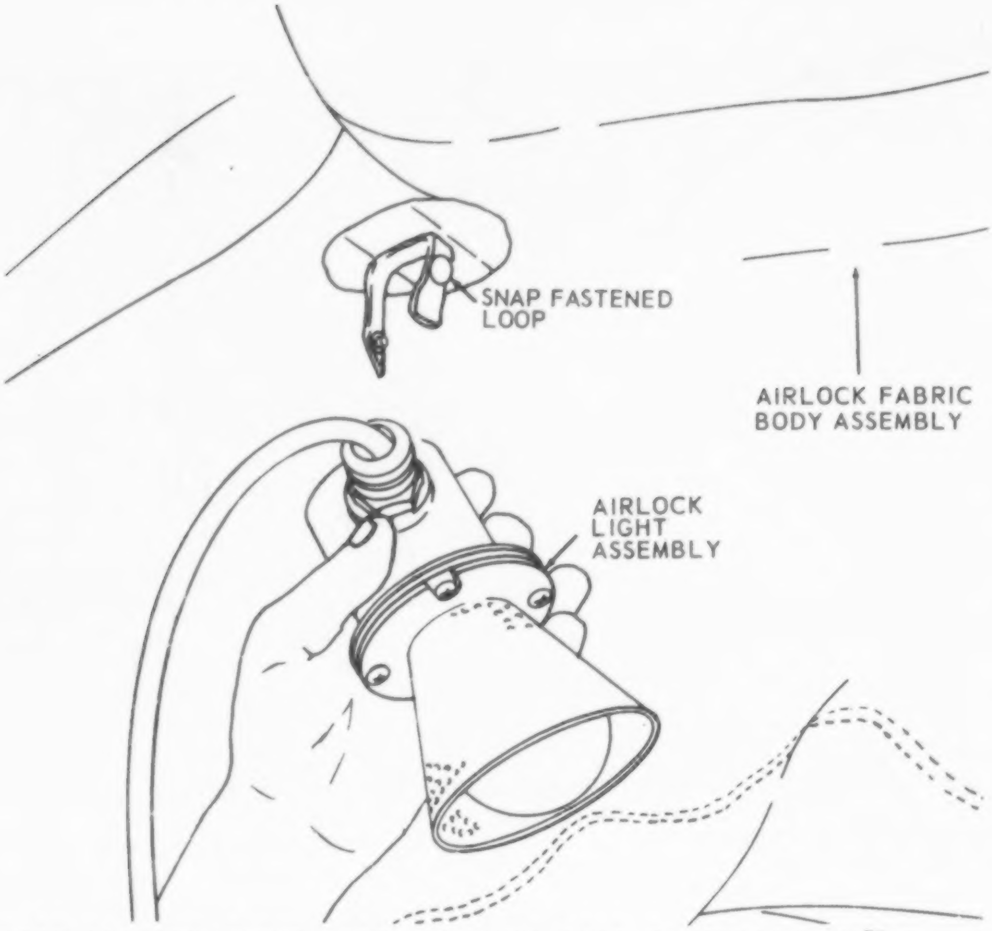
Figure 4-6. Erection of Expandable Shelter (Sheet 31 of 36) (TS 013734)


CLAMP
AIR DUCT ADAPTER
AIR DUCT ADAPTER PORT COVER (2)

PLACE AIR DUCT ADAPTER PORT COVER ON AIR DUCT ADAPTER PROT AND SECURE WITH CLAMP.

TS013735

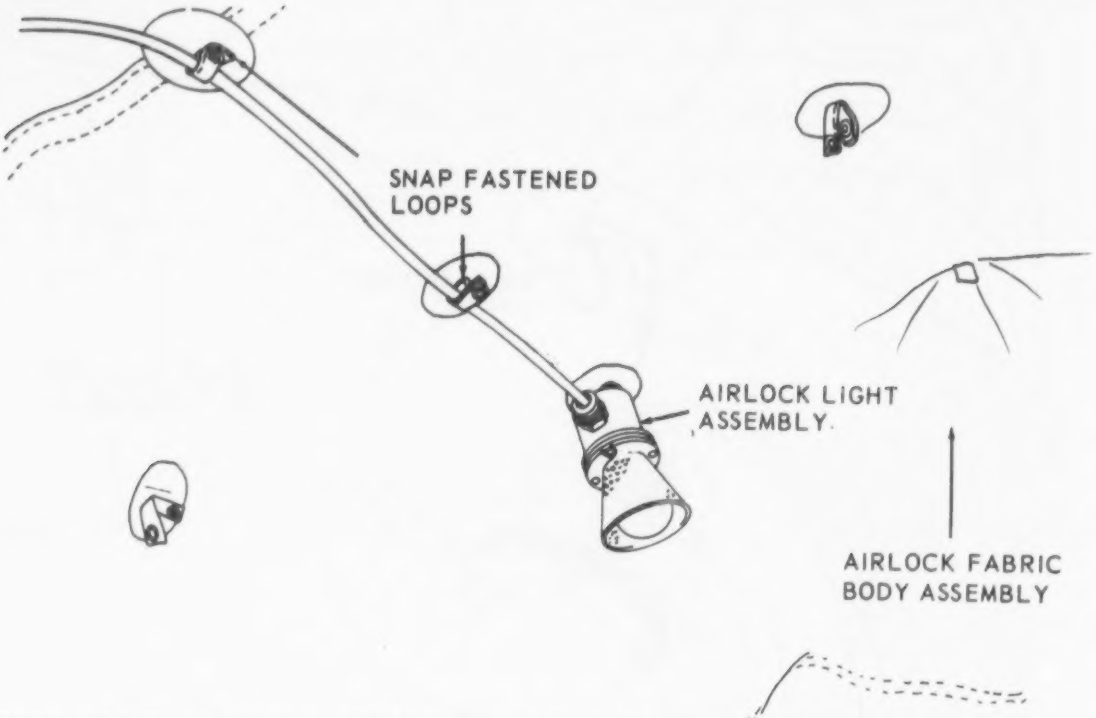
Figure 4-6. Erection of Expandable Shelter (Sheet 32 of 36) (TS 013735)


SNAP FASTENED LOOP
AIRLOCK FABRIC BODY ASSEMBLY
AIRLOCK LIGHT ASSEMBLY

HOOK AIRLOCK LIGHT ASSEMBLY ONTO SNAP FASTENED LOOP IN TOP OF AIRLOCK FABRIC BODY ASSEMBLY.

TSO13736

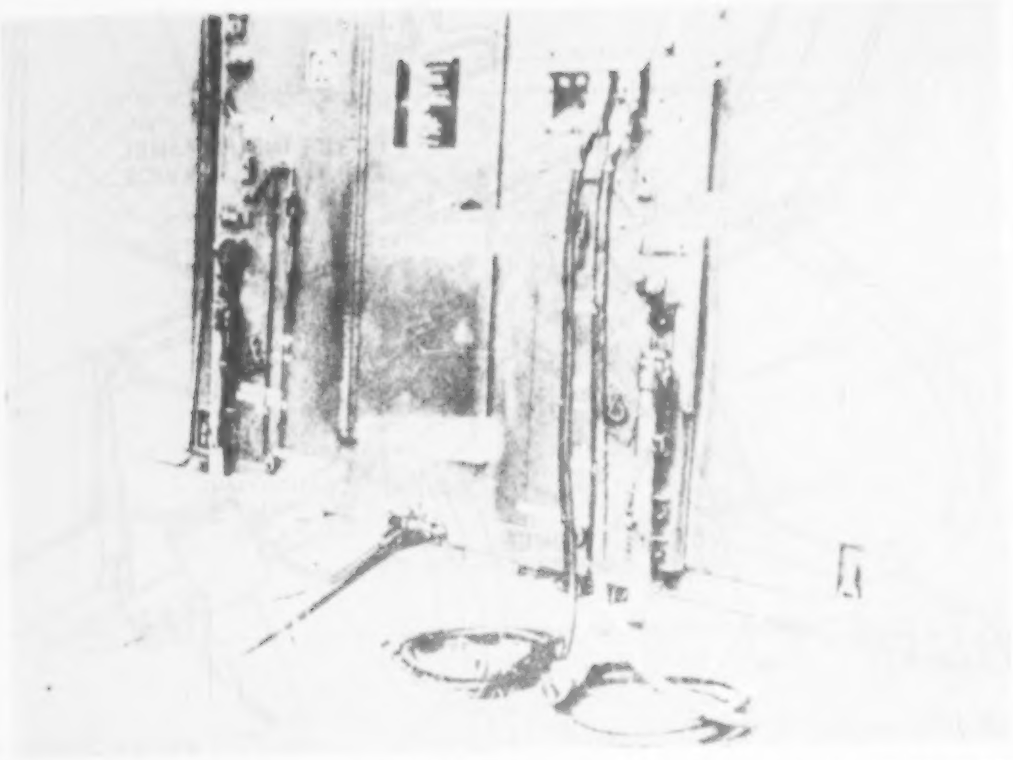
Figure 4-6. Erection of Expandable Shelter (Sheet 33 of 36) (TS 013736)


SNAP FASTENED LOOPS
AIRLOCK LIGHT ASSEMBLY
AIRLOCK FABRIC BODY ASSEMBLY

SECURE LIGHT ASSEMBLY ELECTRICAL CABLE TO SNAP FASTENED LOOPS IN TOP OF AIRLOCK FABRIC BODY ASSEMBLY. CONNECT ELECTRICAL CABLE TO AIRLOCK LIGHT RECEPTACLE ON POWER INPUT PANEL.

TS013737

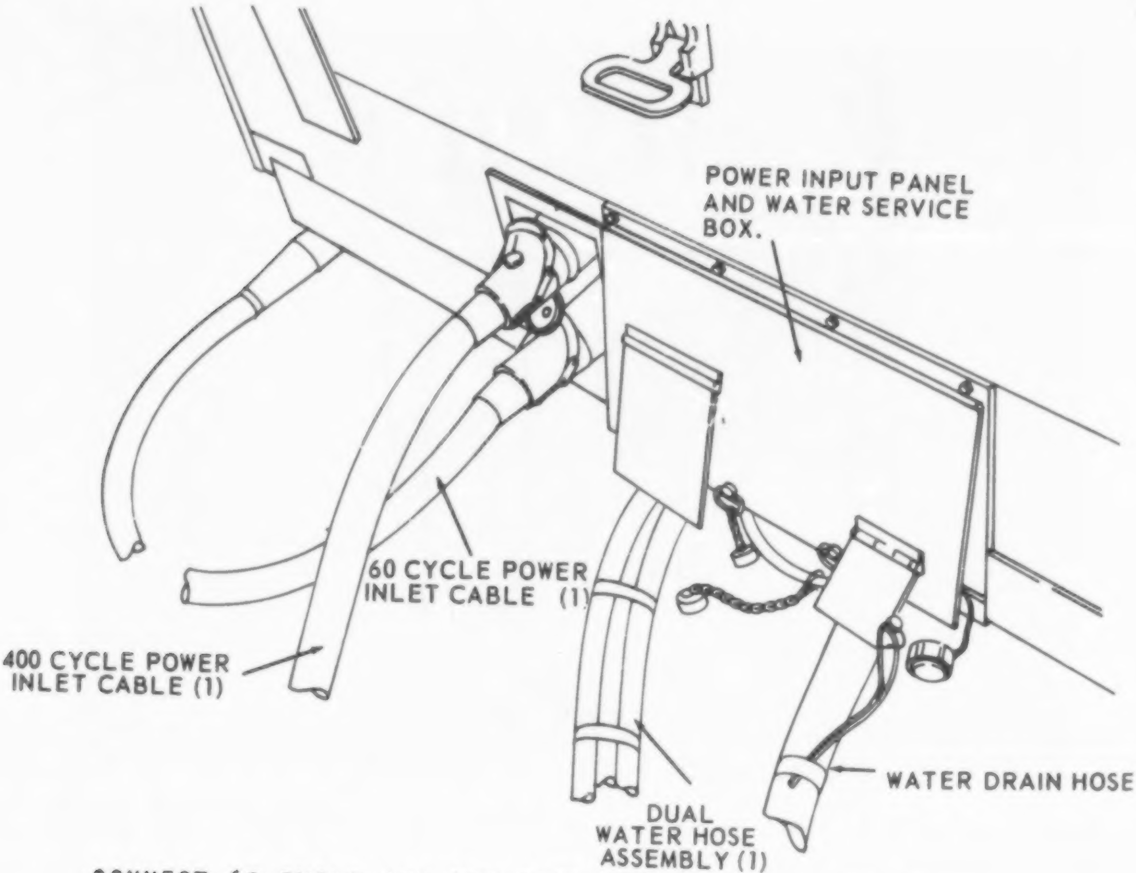
Figure 4-6. Erection of Expandable Shelter (Sheet 34 of 36) (TS 013737)



CONNECT SUITABLE 60 CYCLE AND 400 CYCLE POWER OUTPUT CABLES TO POWER OUTPUT PANEL. CONNECT SUITABLE DUAL OUTLET WATER HOSE AND WATER DRAIN HOSE OUTLET TO WATER OUTLET PANEL.
NOTE: CONNECTIONS ARE TO INTERCONNECT SHELTERS.

TS013738

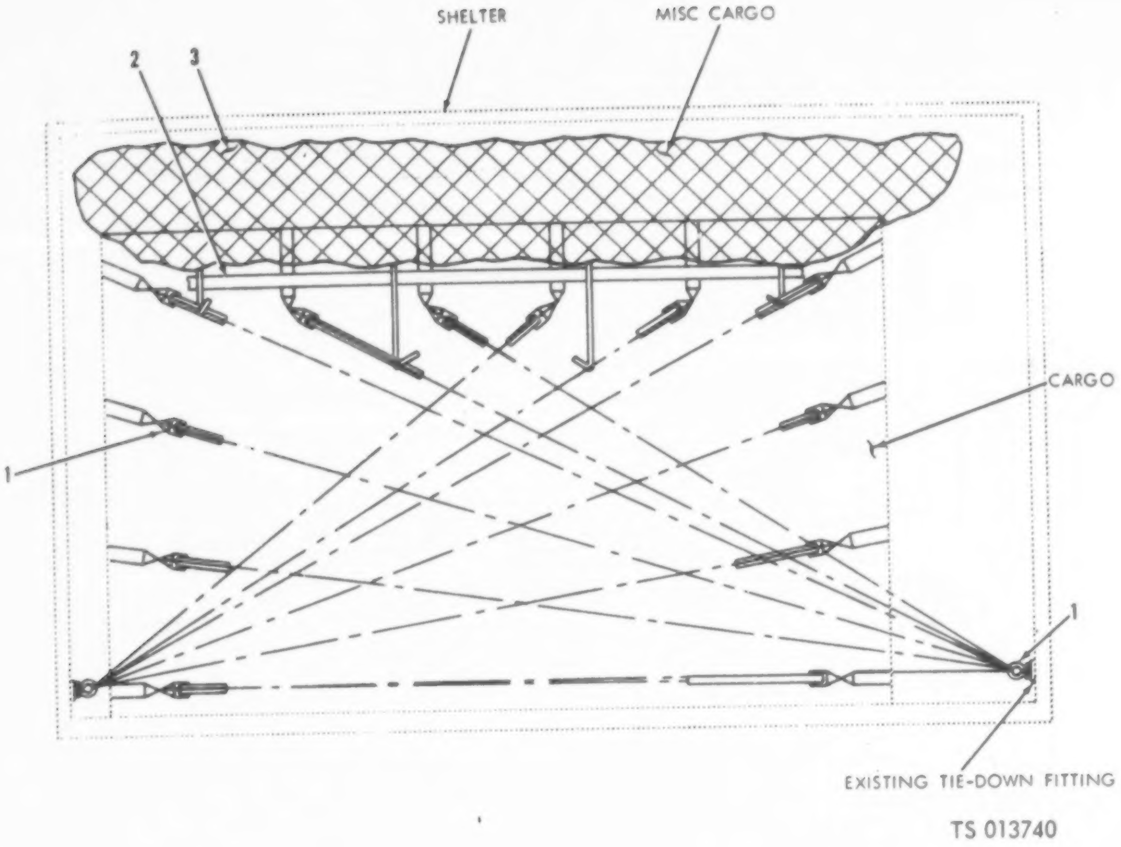
Figure 4-6. Erection of Expandable Shelter (Sheet 35 of 36) (TS 013738)


POWER INPUT PANEL AND WATER SERVICE BOX.
60 CYCLE POWER INLET CABLE (1)
400 CYCLE POWER INLET CABLE (1)
WATER DRAIN HOSE
DUAL WATER HOSE ASSEMBLY (1)

CONNECT 60 CYCLE AND 400 CYCLE POWER INLET CABLES, DUAL WATER HOSE TO POWER INPUT PANEL AND WATER SERVICE BOX.

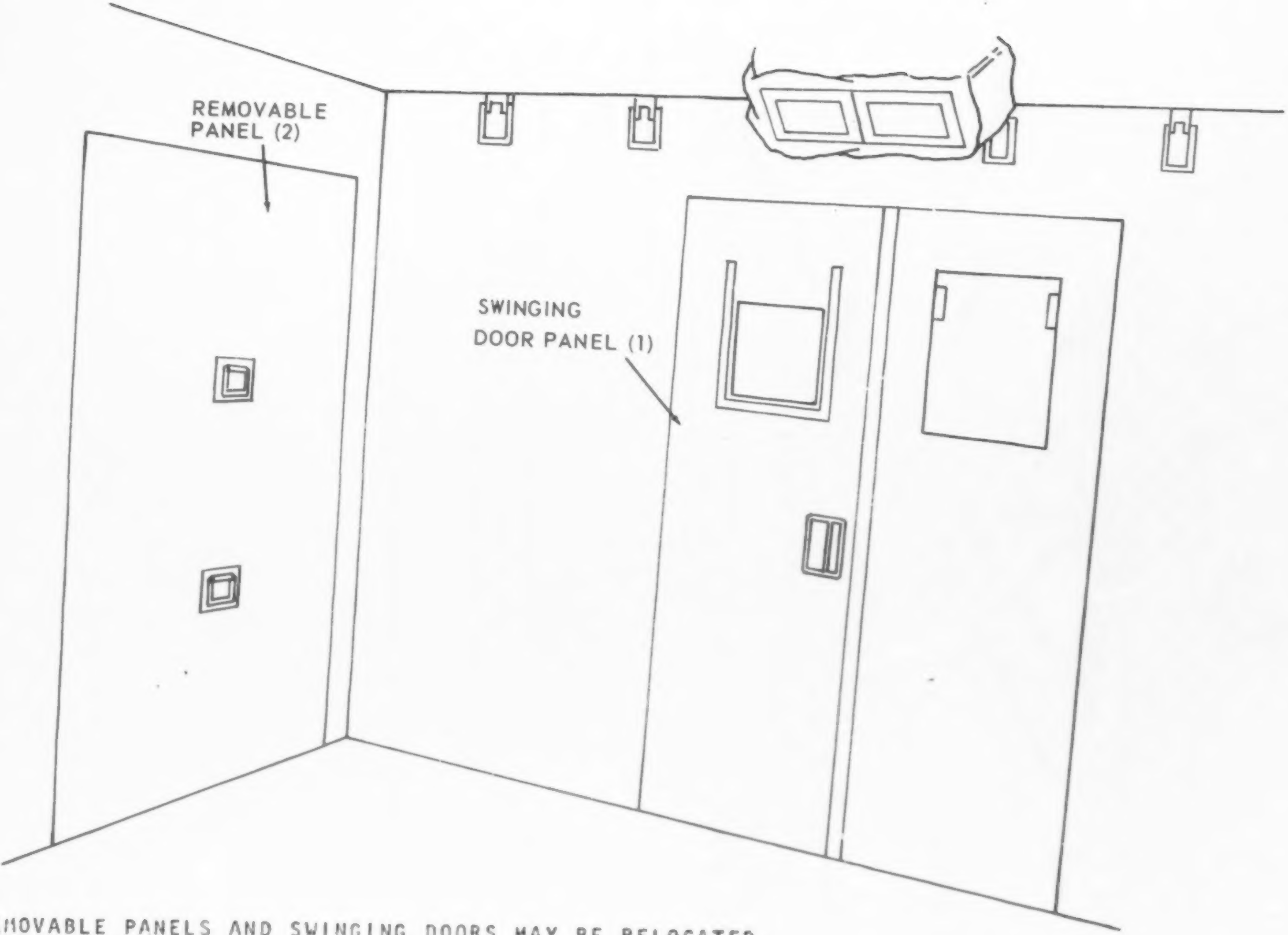
TS013739

Figure 4-6. Erection of Expandable Shelter (Sheet 36 of 36) (TS 013739)


SHELTER
MISC CARGO
2
3
CARGO
1
1
EXISTING TIE-DOWN FITTING
TS 013740

1. Strap assembly
2. Web net assembly
3. Rope net assembly

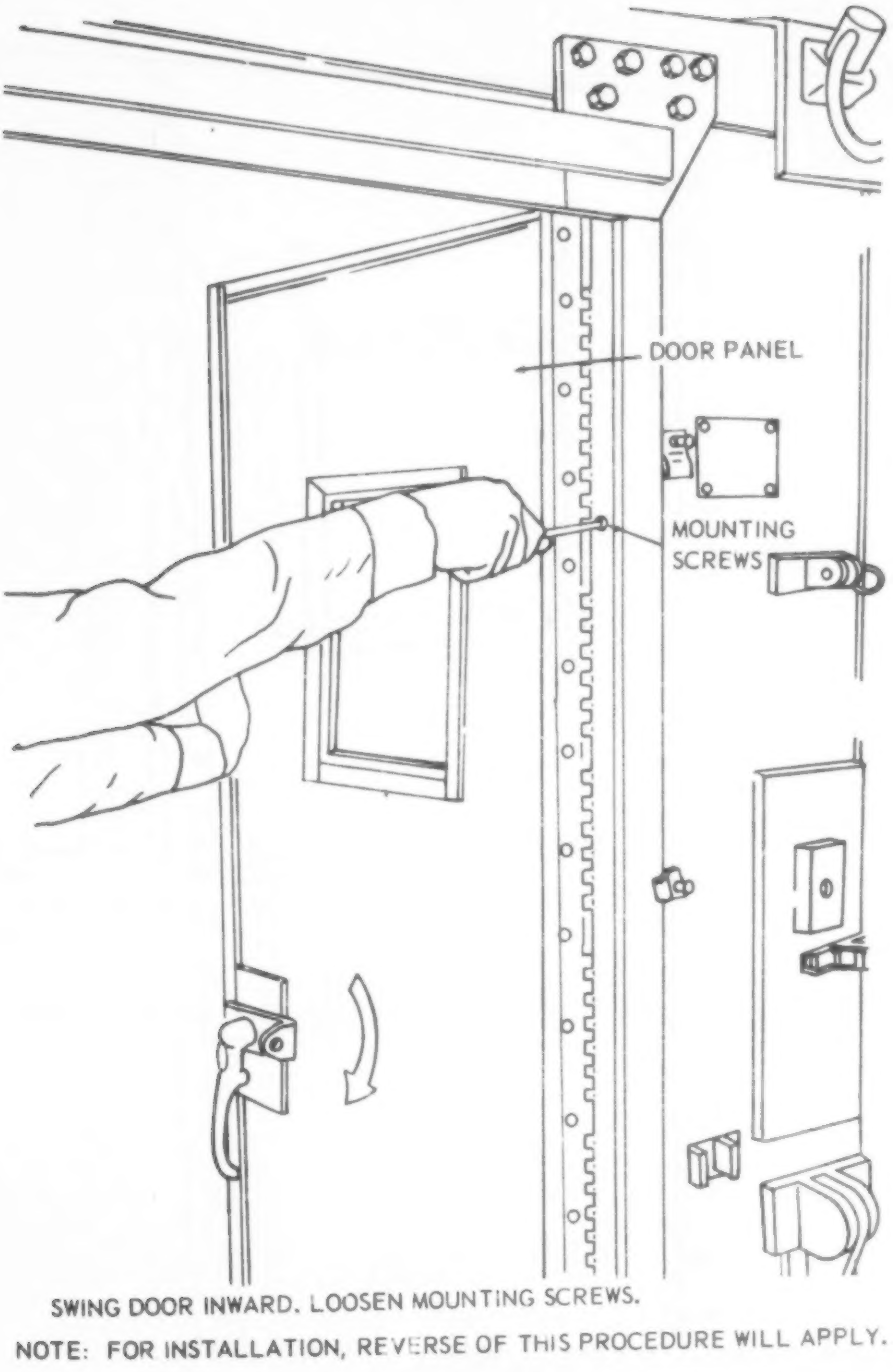
Figure 4-7. Cargo Tiedown, Removal/Installation (TS 013740)


REMOVABLE
PANEL (2)
SWINGING
DOOR PANEL (1)

REMOVABLE PANELS AND SWINGING DOORS MAY BE RELOCATED.
NOTE: OPPOSITE END OF EXPANDABLE SHELTER IS SAME AS SHOWN.

TS013741

Figure 4-8. Interchanging Removal Panels and Swinging Door Panels (Sheet 1 of 2) (TS 013741)

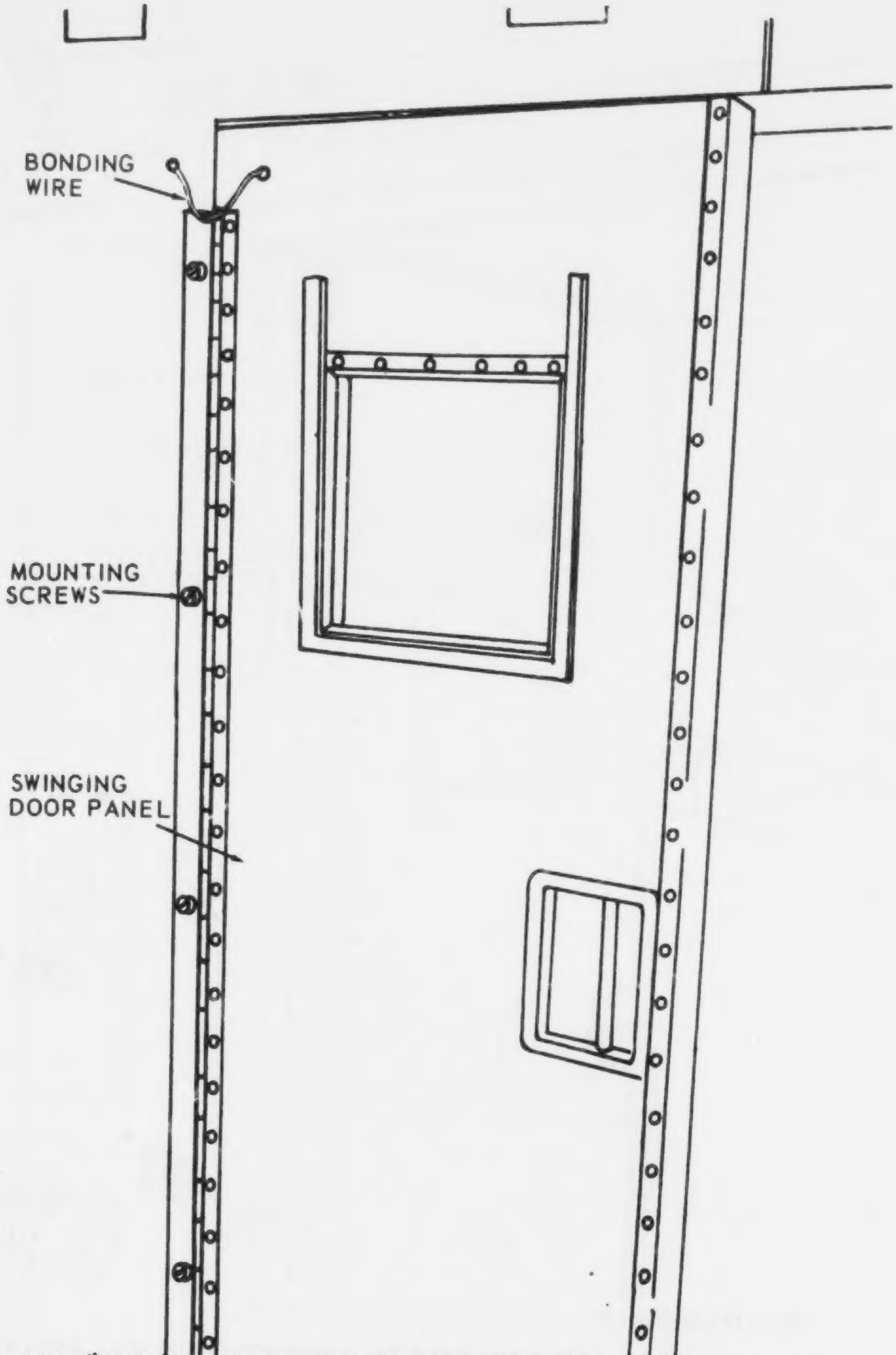

DOOR PANEL
MOUNTING SCREWS

SWING DOOR INWARD. LOOSEN MOUNTING SCREWS.

NOTE: FOR INSTALLATION, REVERSE OF THIS PROCEDURE WILL APPLY.

TS013742

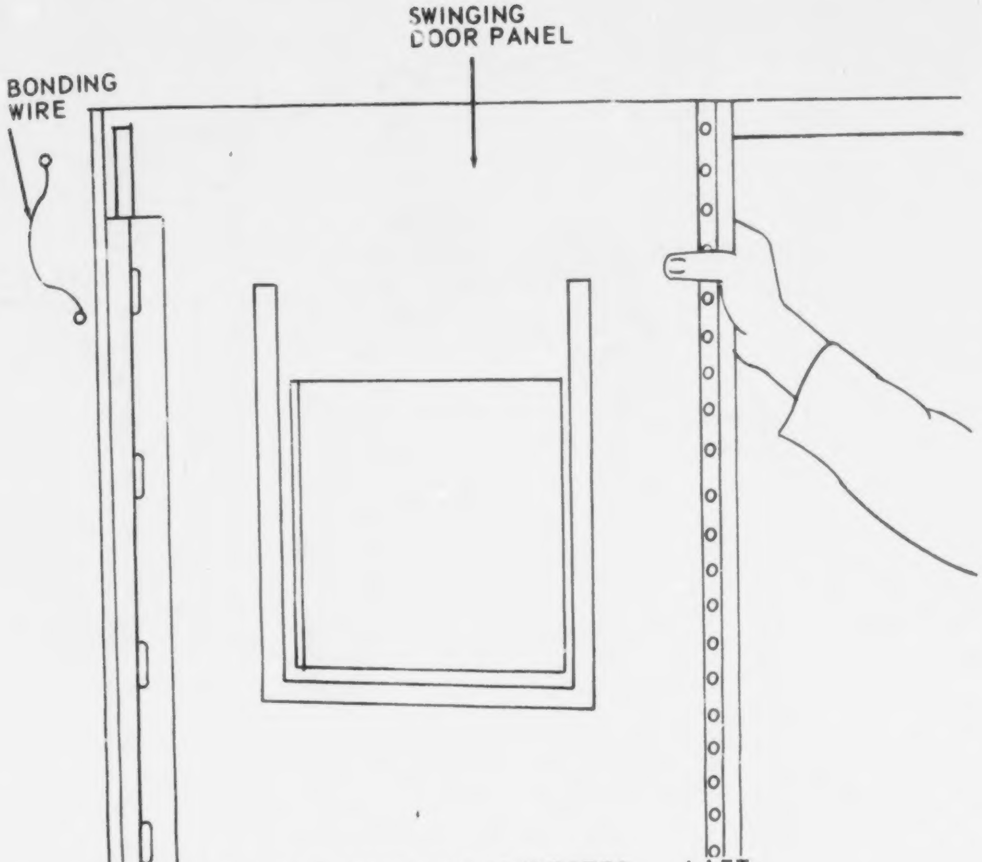
Figure 4-8. Interchanging Removal Panels and Swinging Door Panels (Sheet 2 of 7) (TS 013742)


BONDING WIRE
MOUNTING SCREWS
SWINGING DOOR PANEL

SWING FLOOR OUTWARD. DISCONNECT BONDING WIRE AND LOOSEN MOUNTING SCREWS.
NOTE: FOR INSTALLATION, REVERSE OF THIS PROCEDURE WILL APPLY.

TS013743

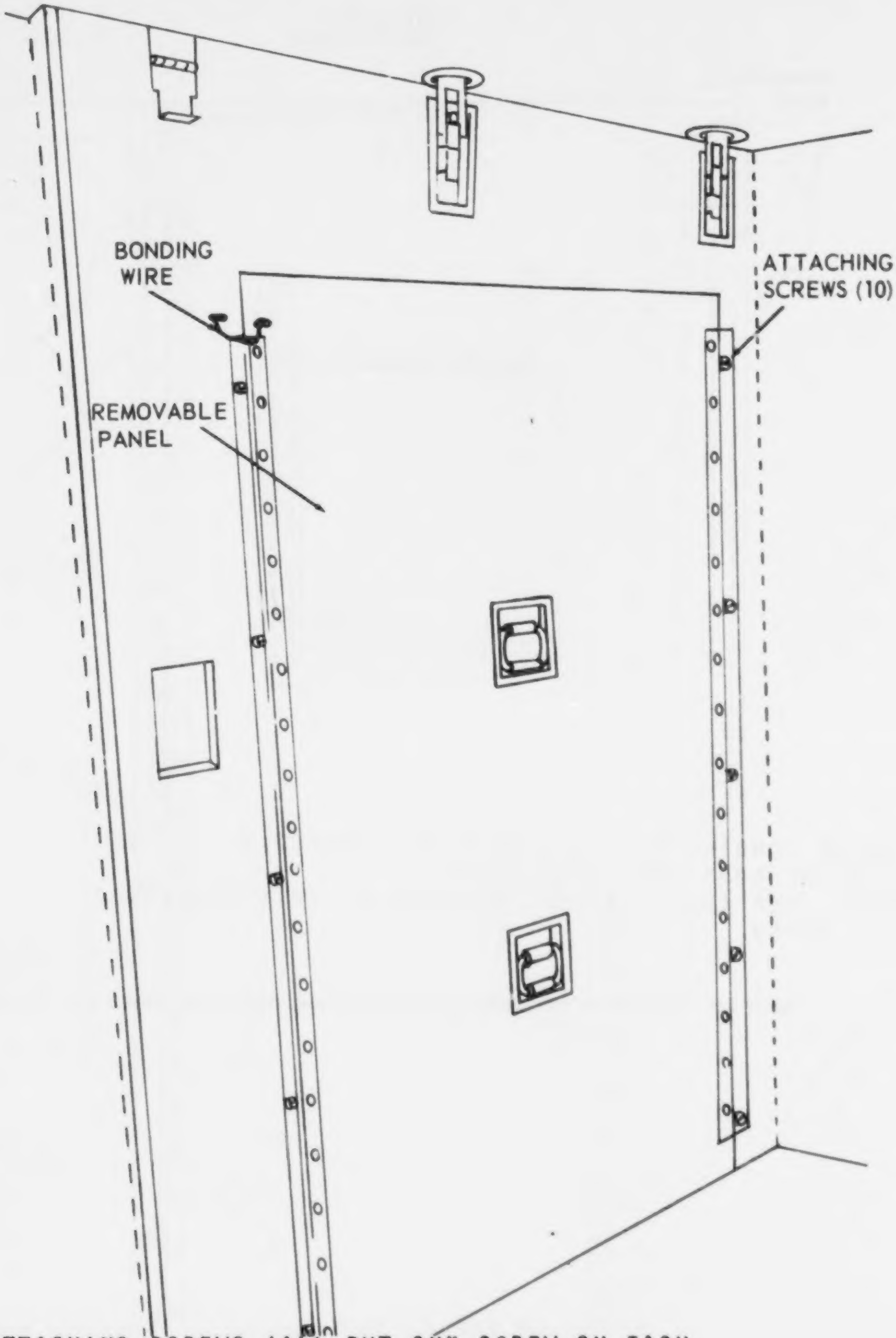
Figure 4-8. Interchanging Removale Panels and Swinging Door Panels (Sheet 3 of 7) (TS 013743)


SWINGING DOOR PANEL
BONDING WIRE
TSO13744

ENSURE BONDING WIRE HAS BEEN DISCONNECTED. LIFT SWINGING DOOR AWAY FROM PANEL.
NOTE: FOR INSTALLATION, REVERSE OF THIS PROCEDURE WILL APPLY.

Figure 4-8. Interchanging Removable Panels and Swinging Door Panels (Sheet 4 of 7) (TS 013744)

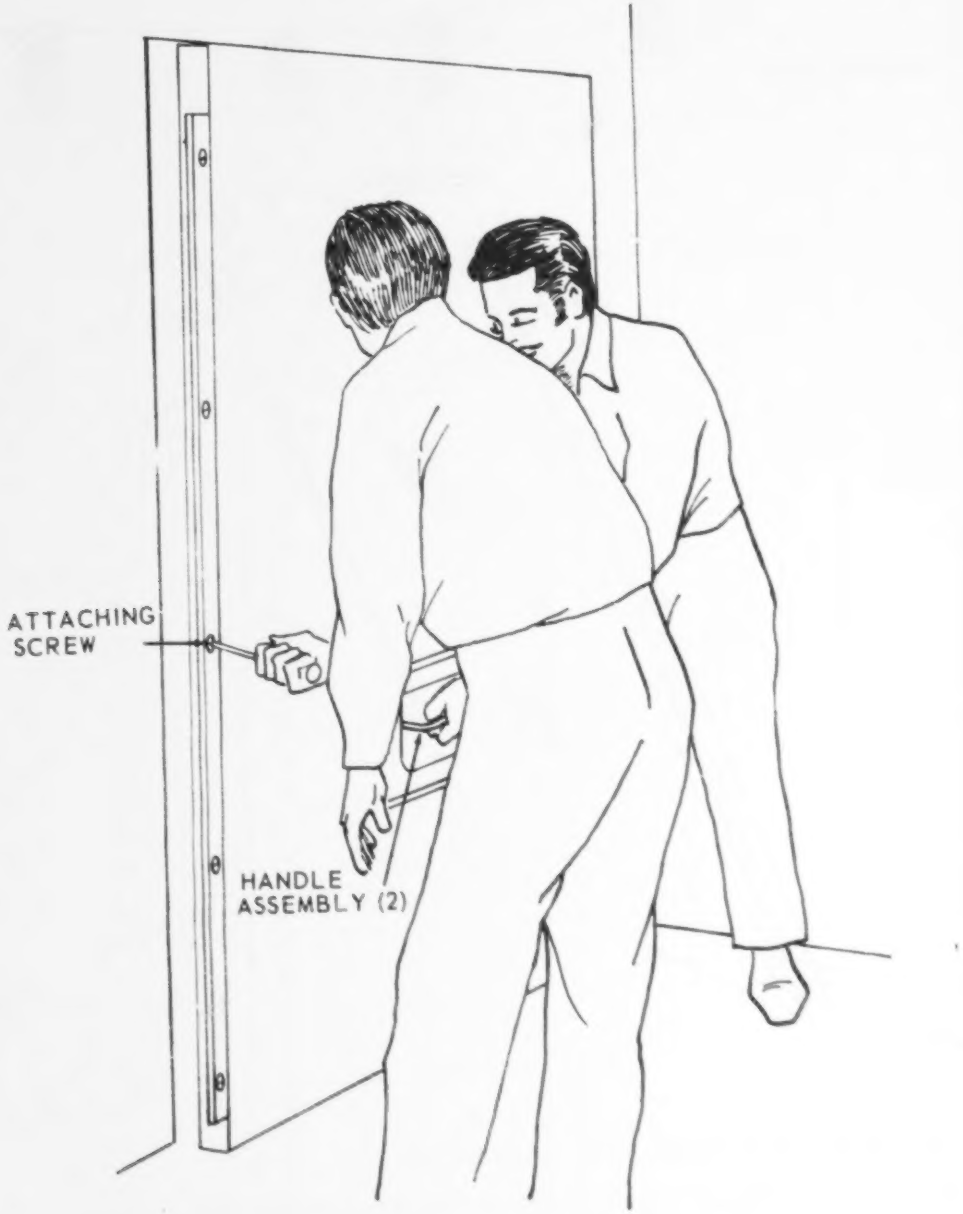
best copy available


BONDING WIRE
ATTACHING SCREWS (10)
REMOVABLE PANEL

LOOSEN ATTACHING SCREWS (ALL BUT ONE SCREW ON EACH SIDE OF PANEL). DISCONNECT BONDING WIRE LOCATED AT UPPER RIGHT CORNER OF REMOVABLE PANEL.
NOTE: FOR INSTALLATION, REVERSE OF THIS PROCEDURE WILL APPLY.

TS013745

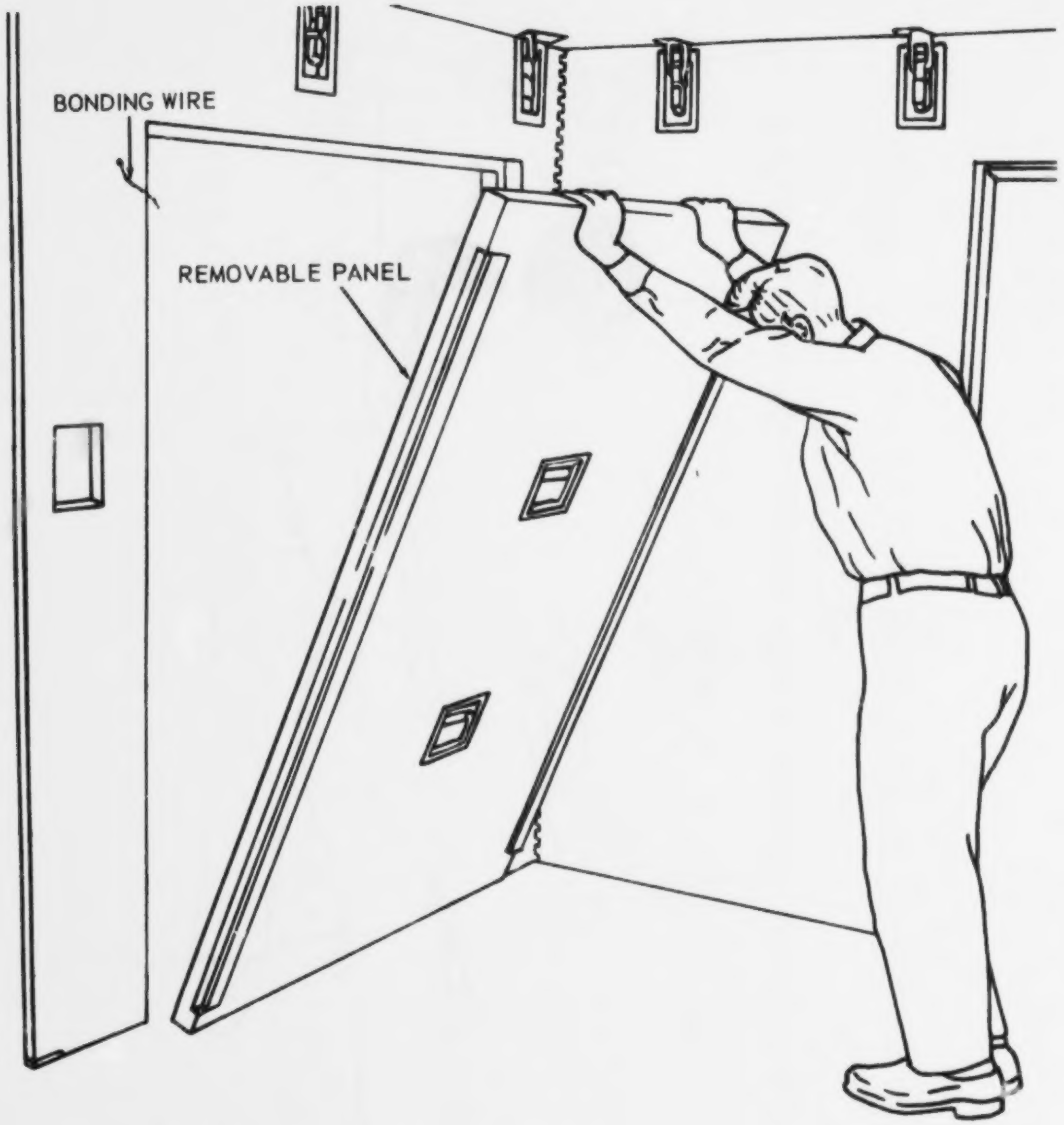
Figure 4-8. Interchanging Removable Panels and Swinging Door Panels (Sheet 5 of 7) (TS 013745)


ATTACHING SCREW
HANDLE ASSEMBLY (2)

LIFT UP HANDLE ASSEMBLY TO RELIEVE TENSION ON REMAINING ATTACHING SCREWS. LOOSEN ATTACHING SCREW.

TS013746

Figure 4-8. Interchanging Removable Panels and Swinging Door Panels (Sheet 6 of 7) (TS 013746)

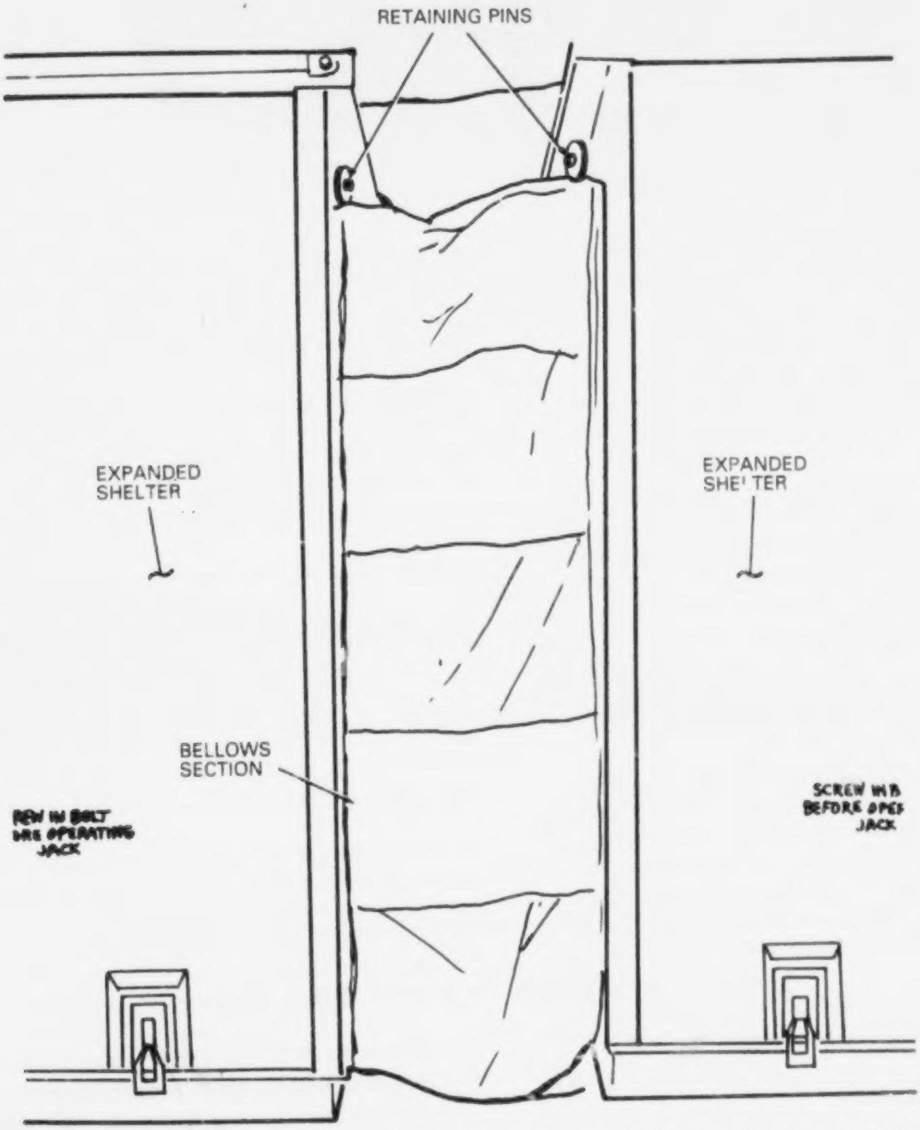

BONDING WIRE
REMOVABLE PANEL

LEAN REMOVABLE PANEL BACK AND REMOVE.

NOTE: FOR INSTALLATION, REVERSE OF THIS PROCEDURE WILL APPLY.

TS013747

Figure 4-8. Interchanging Removable Panels and Swinging Door Panels (Sheet 7 of 7) (TS 013747)


RETAINING PINS
EXPANDED SHELTER
EXPANDED SHELTER
BELLOWS SECTION

REW IN BOLT
ORE OPERATING
JACK

SCREW IN B
BEFORE OPES
JACK

1 POSITION BELLOWS SECTION BETWEEN EXPANDED SHELTERS AND ATTACH WITH RETAINING PINS. SECURE BELLOWS SECTION TO SHELTER AS SHOWN IN STEP 2, PARAGRAPH 4-3C.

Figure 4-9. Installation of Bellows Section and Tread Plates (Sheet 1 of 2) (TS 013748)

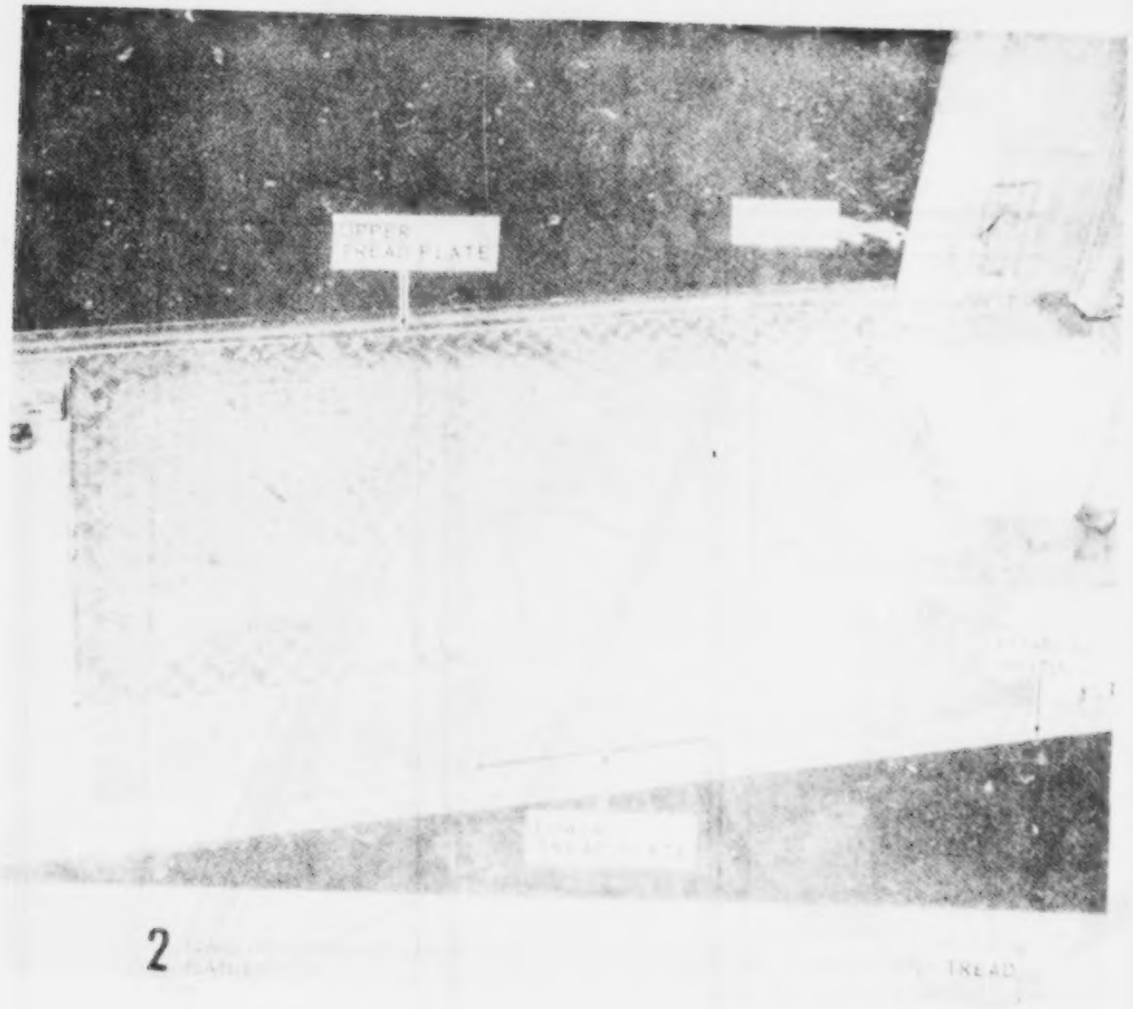


Figure 4-9. Installation of Bellows Section and Tread Plates (Sheet 2 of 2) (TS 013749)

Section II. MOVEMENT TO A NEW WORK SITE

4-4. Dismantling for Movement

a. General. In general, the procedures for dismantling the expandable shelter are the reverse of those used for erection. If required for clarification of procedures or for identification of components, reference should be made to applicable erection (fig. 4-6, sheets 1 thru 36). All accessory equipment, furniture, or other items installed in the shelter during use shall be removed or positioned in center section and all external utility services shall be off or disconnected prior to dismantling shelter.

b. Draining and Purging of Water System. Drain and purge the water system as follows:

(1) Remove the supply hose from the water supply tank.

(2) Flow hot water and cold water into the closet shelter until the utility element water supply is depleted.

(3) Shut off the water pumps in the utility element.

(4) Disconnect the hot water recirculating hose at the valve shutoff on the utility element.

(5) Drain the utility element hot water tank by turning on the drain tank valve.

(6) Open up all the otehr water drains at the utility element.

(7) Disconnect the external water supply hose at the utility element and connect the compressed air hose.

(8) Open the compressed air valve about half way to purge residual water.

(9) As the water ceases to flow from the utility element drains, cap all the drains in sequence.

(10) Turn the compressed air on all the way and operate the shelter faucets until no water flows, only air. Depress nozzle on flex hose only until all water is purged.

(11) Open the faucet drain valves and actuate the faucets with the drain valves open.

(12) With the sump cover strainer removed insert the compressed air hose into the sump drain. Purge sump and drain line.

(13) Close the hot and cold water valves on the utility element.

(14) Disconnect the dual water hose and the supply and drain water hose from the connection panel. Drain all hoses and purge. Coil hoses and secure ends for storage.

(15) Drain and purge all hoses and shelter plumbing.

(16) Drain the utility element water system as follows:

(a) Remove drain caps from hot water tank, heat-exchanger and surge tank drains. Open hot and cold water faucets, the drain, and return valves and the hot water and surge tank vent valves until all water has drained from the system, then close vent valves.

(b) Connect compressed air hose assembly to compressed air outlet fitting. Hold discharge end of air hose assembly against cold water outlet fitting. Open compressed air valve approximately 20-to-30 Deg to deliver a small flow of compressed air into water system to purge residual water.

CAUTION

Observe water system tank and plumbing for excessive heating due to purge air. If external temperature of water system components approaches safe touch temperature, decrease compressed air flow or shut off air flow completely until system cools. Excessive temperature will damage the pump and valve seals.

(c) When all water has been purged, note which water connection is discharging maximum amount of air, then close that connection. Continue to close connections discharging maximum amount of air until only one connection remains open, then shut off compressed air. Remove air hose from cold water outlet fitting and close remaining connection and cold water outlet valve. Disconnect compressed air hose assembly from compressed air outlet fitting, coil hose assembly, and secure ends for storage.

c. *Dismantling Air Lock Chamber.* Dismantle air lock chamber as follows:

(1) Disconnect air lock light assembly electrical cable from light cable receptacle at power input or output panel. Remove light assembly from air lock chamber.

(2) Disconnect guy line ropes from cable assemblies to ground anchors. Remove tent pins. Remove bow spikes installed under bow frame assemblies.

NOTE

Do not remove ground anchors. Remove cable clamp on end of cable assembly and pull open end of cable through installed ground anchor to free cable assembly.

(3) Remove bow frame assemblies from air lock chamber. Separate bow frames and wrap with attached guy line ropes to secure for shipment.

(4) Open and disengage zipper connection between air lock chamber and air lock adapter, unsnap and remove air-lock adapter from shelter.

(5) Fold fabric body assembly for shipment.

d. *Dismantling Expandable Shelter.* Dismantle the shelter as follows:

(1) Refer to figure 4-6, sheet 36, and disconnect 60 cycle and 400 cycle power inlet cables, dual water hose assembly, and water drain hose from power input panel and water service box.

(2) Refer to figure 4-6, sheet 35, and disconnect 60 cycle and 400 cycle power output cables from power output panel. Disconnect dual outlet water hose and water drain hose outlet from water outlet panel.

(3) Refer to figure 4-6, sheet 34. and unhook light assembly electrical cable from snap fastened loops in top of air lock fabric body assembly. Disconnect electrical cable from air lock light receptacle on power input panel.

(4) Refer to figure 4-6, sheet 33, and unhook air lock light assembly from snap fastened loop in tock of air lock fabric body assembly.

(5) Refer to figure 4-6, sheet 32, and disengage clamp and remove air duct adapter port cover from air duct adapter port.

(6) Refer to figure 4-6, sheet 31, and disengage air duct adapter clamp and remove conditioned air duct from air duct adapters.

(7) Refer to figure 4-6, sheet 30, and refold conditioned air duct and clip retainer to cross bars.

(8) Refer to figure 4-6, sheet 29, and disengage air duct adapter clamp and free air duct adapter from flange. Disengage latches by reaching through air distribution plenum zipper area. Remove air duct adapter.

(9) Refer to figure 4-6, sheet 27 and 28, and disengage plenum latches and remove air distribution plenum from bottom of flange assembly.

(10) Refer to figure 4-6, sheet 26, and disengage latches and remove flange assembly.

(11) Refer to figure 4-6, sheet 25, and close duct cover and secure hatches.

(12) Refer to figure 4-6, sheet 24, and disconnect guy line rope from cable assembly. Remove ground anchor with cable assembly installed.

(13) Refer to figure 4-6, sheet 23, and remove fabric fastener tape and unzip zipper freeing air lock door assembly from air lock chamber.

(14) Refer to figure 4-6, sheet 22, and lift bow assembly from bow spikes and pull up spikes.

(15) Refer to figure 4-6, sheet 21, and disengage bow holding snap assemblies and remove bow assemblies from air lock chamber.

(16) Refer to figure 4-6, sheet 20, and remove retaining pins and disassemble bow sections.

(17) Refer to figure 4-6, sheet 19, and remove fabric fastener tape and unzip the zipper to remove air lock chamber from air lock adapter.

(18) Refer to figure 4-6, sheet 17 and 18, and unhook drawstring from receptacle. Disengage all fasteners and pins and remove air lock adapter.

(19) Refer to figure 4-6, sheet 15, and disengage folding roof to end panel.

(20) Refer to figure 4-6, sheet 14, and disengage folding end panels and side panel assemblies to folding floor latches.

(21) Refer to figure 4-6, sheet 12 and 13, and remove pins securing support assemblies along edge of folding roof.

(22) Refer to figure 4-6, sheet 11, and disengage latch freeing side panel assemblies.

(23) Refer to figure 4-6, sheet 10, and remove leveling jacks.

(24) Refer to figure 4-6, sheet 9, and fold side panel aseembly and engage latch.

NOTE

Procedure also applies to adjacent side panel assembly.

(25) Refer to figure 4-6, sheet 8, and fold end panels.

(26) Refer to figure 4-6, sheet 6 and remove leveling jack from base plate.

(27) Refer to figure 4-6, sheet 5, and raise folding floor into position. Remove hook from ring assembly and secure latch.

(28) Refer to figure 4-6, sheet 4, and install hook and cable assembly, and engage latch.

(29) Refer to figure 4-6, sheet 3, and hold up roof (at least three men) and raise support assemblies out after removing pins. Lower roof.

(30) Refer to figure 4-6, sheet 2, and release leveling jacks.

(31) Refer to figure 4-6, sheet 1, and install support assemblies to folding roof and install pins.

e. Installation of Cargo Tiedown Installation. Refer to the below listed instructions and isntall the cargo tiedown installation.

(1) Attach the metal ring of the strap assembly (1, fig. 4-7) to the shelter tiedown fittings and tighten the strap assembly.

(2) Place the web net assembly (2) over the cargo and fasten securely.

(3) Place miscellaneous cargo on top of main cargo and secure with the rope net assembly (3) using the strap assembly (1) as a means of attachment.

4-5. Loading and Unload Expandable Shelter

a. Refer to TM 9-2330-275-14, chapter 2, section II, for instructions pertaining to the use of a dolly set in moving the expandable shelter.

b. Shelter is to be laoded on flatbed trailer/trucks/railway cars only.

4-6. Reinstallation After Movement

Refer to paragraph 4-2 for installation instruction.

Section III. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-7. Tools and Equipment

Refer to Appendix B, Maintenance Allocation Chart, Section III, for tools and equipment required by organizational maintenance personnel for maintenance of the expandable shelter.

4-8. Special Tools and Equipment.

There are no special tools or equipment required by organizational personnel for maintenance of the expandable shelter.

4-9. Maintenance Repair Parts

Repair parts or equipment are listed and illustrated in the repair parts and special tools list covering organizational maintenance for the expandable shelter.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (MONTHLY AND QUARTERLY)

4-10. General

To ensure that the expandable shelter is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraph 4-11. Item numbers indicate the sequence of minimum inspection requirements. All deficiencies and short comings will be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest possible opportunity.

4-11. Preventive Maintenance Services

This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by organizational maintenance personnel. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to table 4-1 and figure 4-10 for the preventive maintenance services.

NOTE

When shelters are not in continuous use, PMCS will be performed semiannually. However, certain items (leveling jacks, windows, walls, etc.) on outside of shelter will have PMCS performed as scheduled.

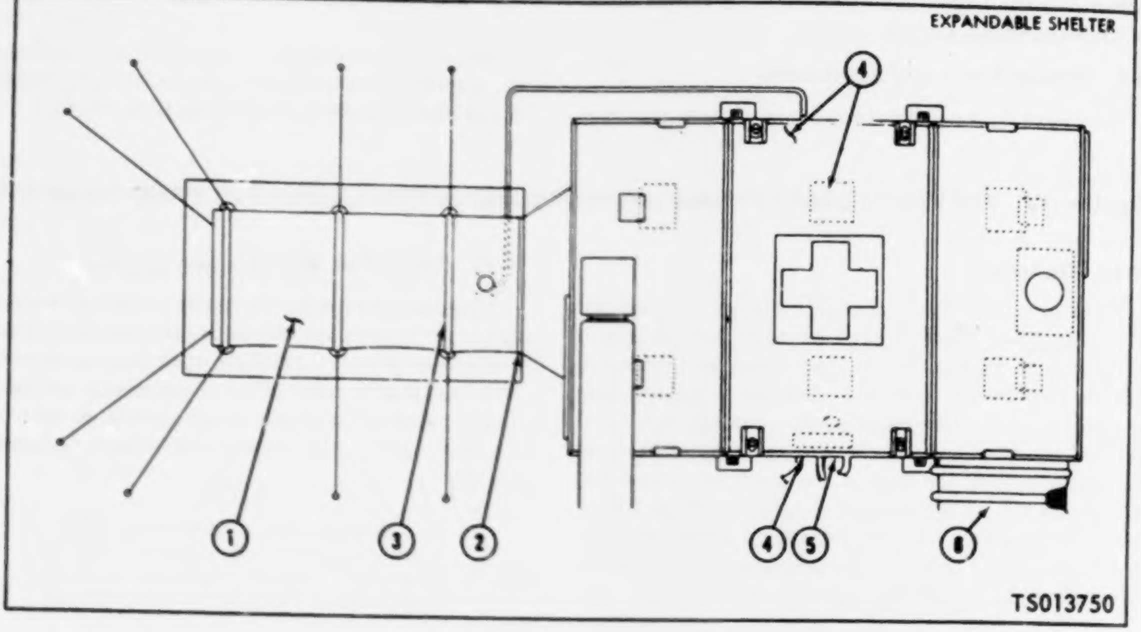
Table 4-1. Organizational Maintenance Preventive Maintenance Checks and Services

M - Monthly
Total manhours required: 1.2

Sequence No.	Item to be inspected procedure	Work time (M/H)
M 1	SHELTER FABRIC (1, FIGURE 4-10) Check fabric inside and outside of air lock for wear at seams for broken stitches, for holes, for weak spots, or other damage to fabric. Repair as required.	0.2 0.1
M 2	ZIPPERS (2, FIGURE 4-10) Check zippers for smooth operation, complete closure, missing teeth, unstitched seams or other damage. Repair as required. Apply zipper lubricant to zipper teeth.	0.3
3	FABRIC FASTENER TAPE (3, FIGURE 4-10) Check for damage and unstitched seams. Repair as required.	0.1

Sequence No.	Item to be inspected procedure	Work time (M/H)
4	ELECTRICAL SYSTEM (4, FIGURE 4-10) Check all electrical connections cables, receptacles, circuit breakers and light assemblies for damage, burned contacts or insulation. Check light assemblies for burned or weak tubes. Report discrepancies to Direct Support Maintenance.	0.2
5	PLUMBING SYSTEM (5, FIGURE 4-10) Check all lines and fittings for leaks, or other damage, check pump and float switch operation. Report discrepancies to Direct Support Maintenance.	0.2
6	BELLOWS ADAPTER (6, FIGURE 4-10) Check fabric inside and outside of bellows for wear at seams, for fabric stitches, for holes, for weak spots, or other damage. Repair as required.	0.2

PREVENTIVE MAINTENANCE SERVICES



1. Shelter fabric
2. Zippers
3. Fabric fastener tape
4. Electrical system
5. Plumbing system
6. Bellows adapter

Figure 4-10. Monthly Preventive Maintenance Services (TS 013750)

Section V. TROUBLESHOOTING

4-12. General

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the expandable shelter. Each malfunction or trouble symptom for an individual expandable shelter or component is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective action for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, you should notify Direct Support Maintenance.

4-13. Organizational and Maintenance Troubleshooting

Table 4-2 lists the common malfunctions that you may find during the operation or maintenance of the expandable shelter or its components. You should perform the tests/inspections and corrective actions in the order listed.

Table 4-2. Troubleshooting

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

---

1. WATER LEAKAGE INTO SHELTER

Step 1. Check for damaged weather seal assemblies.
Replace damaged seal assemblies as outlined in panel disassembly paragraphs, section I and II, chapter 8.

Step 2. Check for loose or improperly positioned seal assemblies.
Position seal assemblies to cover joints in shelter and secure.

2. CIRCUIT BREAKER TRIPPED

Step 1. Test for overload or shorts in electrical circuit (see procedures outlined in table 5-1) using a multimeter or other checking device (para 11-2).
Reset circuit breaker by pushing reset button on control panel. If the circuit breaker will not stay set correctly, report the condition to Direct Support Maintenance for removal and replacement.

Step 2. Check circuit breaker for malfunction using multimeter or other checking device (para 11-2).
Report condition to Direct Support Maintenance for removal and replacement.

3. NO ELECTRICAL POWER INSIDE SHELTER

Step 1. Check for tripped circuit breaker, and test circuit for overload condition and shorts with a multimeter or other checking device (para 11-2).
Reset circuit breaker by pushing reset button on control panel. If the circuit breaker will not stay set correctly, report the condition to Direct Support Maintenance for removal and replacement.

Step 2. Check to ensure external power source is connected.
Connect external power source.

Step 3. Test power input cable assemblies for continuity, using a multimeter or other checking device (para 11-2).
Replace defective cable(s).

WARNING

Personnel must observe extreme caution to avoid contact with electrical circuits when power source is connected. In case of accident from electrical shock, disconnect power source at once. If power source cannot be disconnected, free victim from live conductor with a board or other nonconductor. If victim is unconscious, apply artificial respiration and obtain medical help.

4. NO HOT OR COLD WATER INSIDE SHELTER

Step 1. Check to insure external water source is connected.
Connect water hoses to water source connections.

Step 2. Check dual water hose heater receptacle, or water tunnel heater circuit breaker tripped or dual water hose heater defective (shelter used in areas having ambient temperature below 38F. (3C. only). Check circuit for overload condition and shorts using a multimeter or other checking device (para 11-2).
Reset circuit breaker by pushing the reset button on the control panel. If the circuit breaker will not stay set correctly, report the condition to Direct Support Maintenance for removal and replacement.

5. WASTE WATER WILL NOT DRAIN OR DRAINS SLOWLY

Step 1. Check for clogged lines or drain hoses.
Clean the hose assembly by blowing out with compressed air. Large obstructions in the hose shall be removed using a plumbers snake or other suitable cleaning tool.

Step 2. Check for dirty filter screen in sump.
Remove screen by removing clamps which secures cover to sump and clean screen assembly by washing with clean water under slight pressure and hitting against a solid surface using care not to damage screen assembly. Reinstall screen, cover and clamp.

Step 3. Check for tripped sump pump circuit breaker, and test for overload condition and shorts using a multimeter or other checking device (para 11-2).
Reset circuit breaker by pushing reset button on control panel. If the circuit breaker will not stay set correctly, report the condition to Direct Support Maintenance for removal and replacement.

Table 4-2. Troubleshooting—Continued

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

Step 4. Inspect the check valve to see if it is clogged or blocked.

Replace valve as follows:

a. *Removal.*

(1) Disconnect inlet and outlet fittings from check valve (1, fig. 4-11) located directly behind centrifugal pump in water service inlet box.

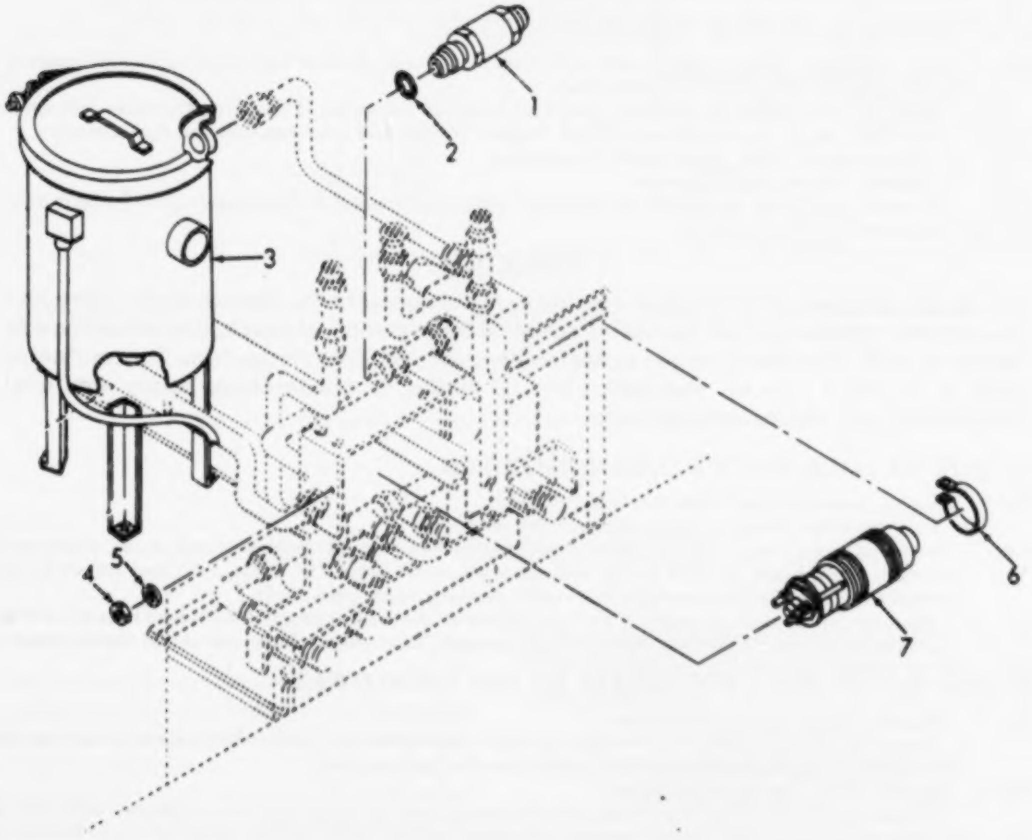
(2) Remove check valve (1) from water service box.

(3) Remove expander fitting from valve (1) and remove packing (2).

b. *Installation.*

(1) Install new packing (2, fig. 4-11) on check valve (1) and install expander.

(2) Position check valve (1) with the arrow pointing down-stream and tighten fittings on check valve (1).



1. Check valve	3. Sump	5. Washer	7. Pump
2. Packing	4. Nut	6. Clamp	

Figure 4-11. Plumbing System Installation, Parial Disassembly (TS 013751)

Table 4-2. Troubleshooting—Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 5. Inspect and test for a defective sump pump as follows:

NOTE

Pump is considered defective if it does not meet the standards of the test.

a. Remove cover from drain sump (3) (fig. 4-11 and fill with water.
b. Close centrifugal sump circuit braker located on electrical distribution panel assembly.
c. Float switch inside the sump assembly (3) shall energize the pump motor and discharge water from sump (3).
d. Float switch shall shut off pump (7) when approximately two inches (5.08 cm) of water is remaining in sump (3). The remaining water will drain by gravity.

Replace a defective pump as follows:

a. Removal. Remove damaged or defective pump assembly according to sequence of index numbers assigned to figure 4-11 and observe the following:

(1) Disconnect inlet and outlet lines from pump (7, fig. 4-11) located inside water service inlet box.
(2) Disconnect electrical connector from end of pump (7).
(3) Remove nuts (4) and washers (5) securing the pump to the pump mounting bracket.
(4) Loosen and slide off clamp (6) securing pump (7) to pump mounting bracket.
(5) Remove pump (7) from water service inlet box.

b. Installation.

CAUTION

Be sure electrical source is off before connecting electrical leads.

(1) Position pump (7, fig. 4-11) in proper position and secure with nuts (4) and washers (5).
(2) Slide clamp (6) over pump (7) and pump mounting bracket and tighten securely.
(3) Connect electrical connector to end of pump.
(4) Connect inlet and outlet lines to pump (7).

Step 6. Check for tripped (out of set position) water tunnel heater or drain hose heater receptacle circuit breaker (shelters used in areas having ambient temperature below 38F. (3C.) only). Check, also, for overload condition and shorts using a multimeter or other checking device (para 11-2).

Reset circuit breaker by pushing reset button on control panel. If the circuit breaker will not stay set correctly, report the condition to Direct Support Maintenance for removal and replacement.

Step 7. Check for defective (worn, deteriorated) drain hose heater.

Report defective drain hose heater to Direct Support Maintenance.

6. NO VACUUM INSIDE SHELTER

Check to insure external vacuum source is connected.

Check connection to vacuum inlet.

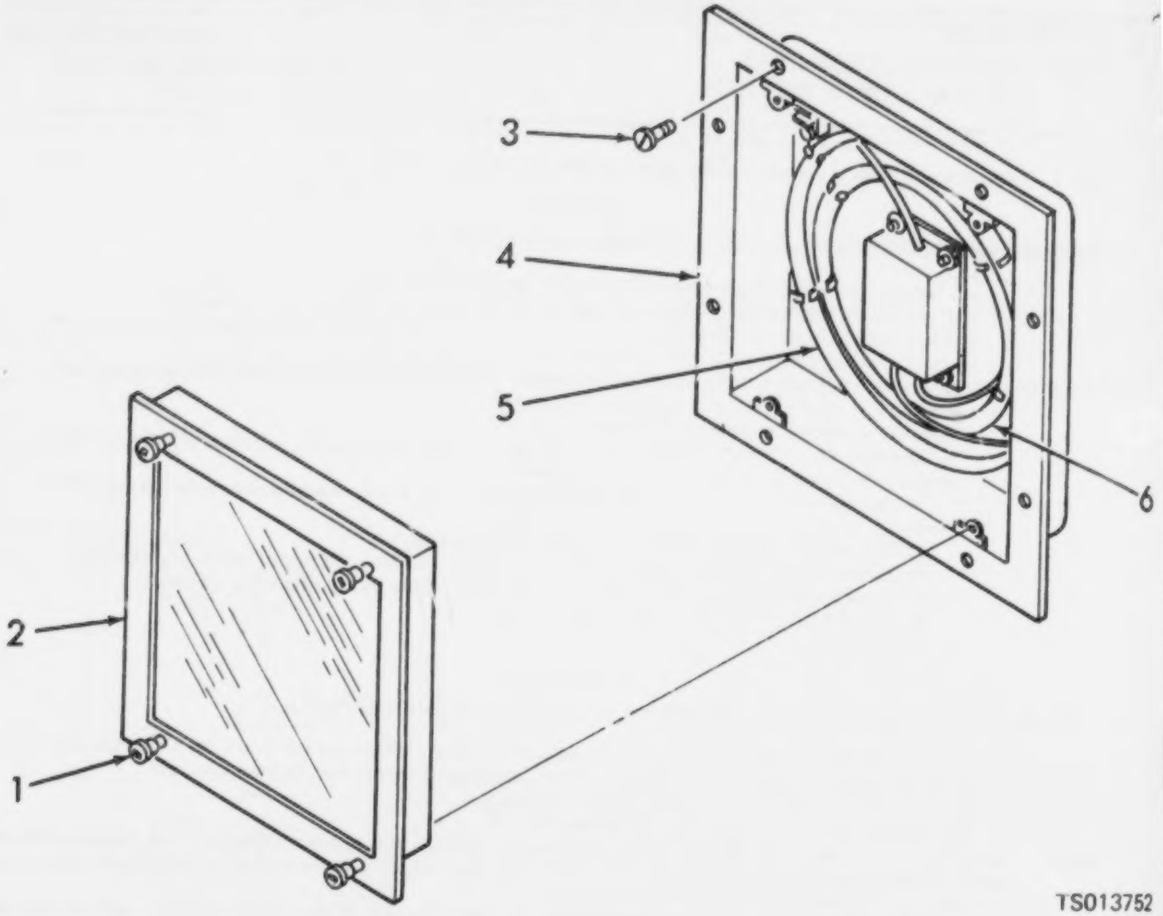
Section VI. RADIO INTERFERENCE SUPPRESSION

4-14. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low resistance path to ground for stray currents. The methods used include shielding the ignition and high frequency wires, grounding the frame with bonding straps and using capacitors and resistors.

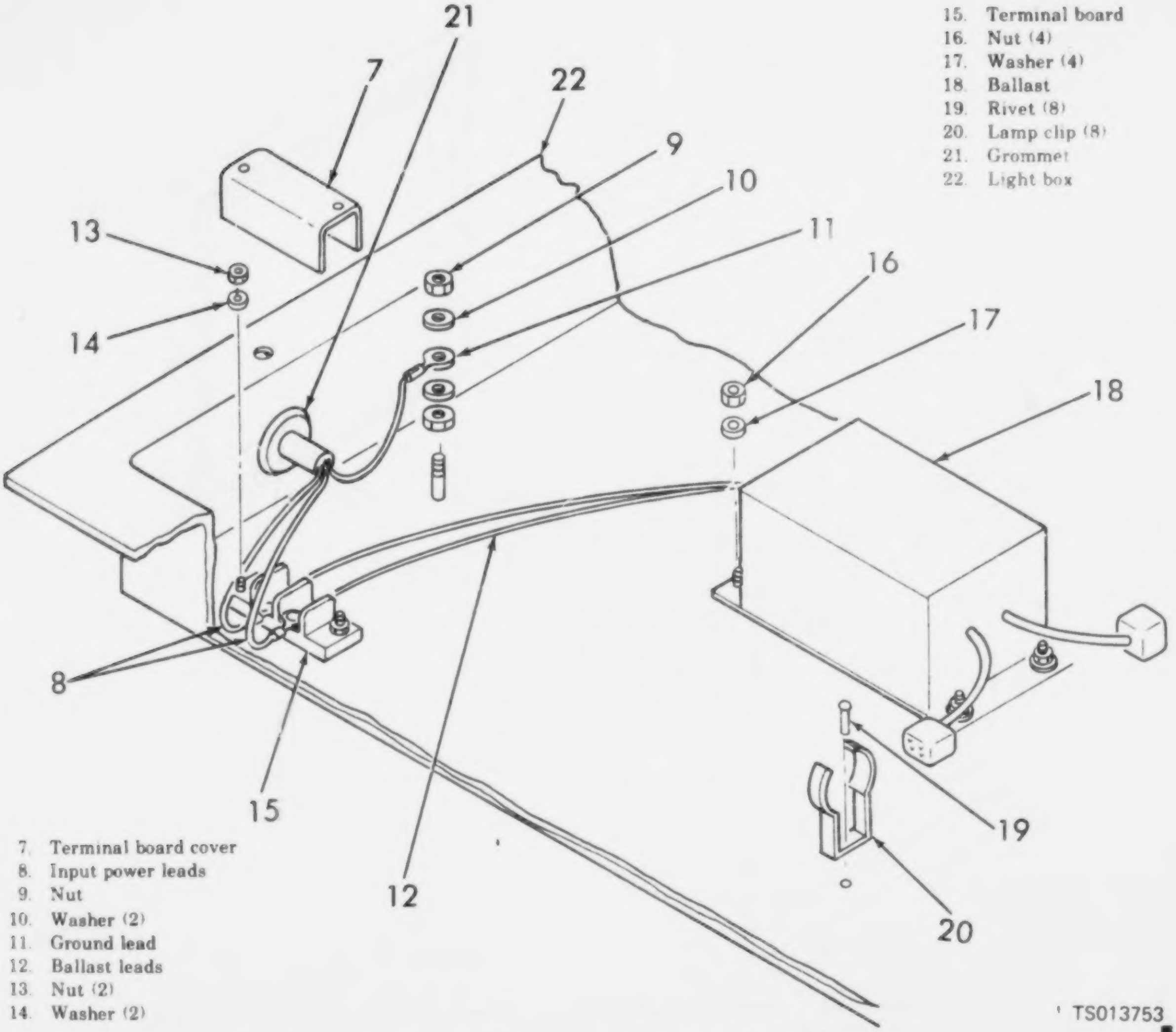
4-15. Interference Suppression Components

The fluorescent lighting fixtures (fig. 4-12, sheets 1 thru 3) are the only components which cause radio interference. The fluorescent fixtures and their ballast transformers meet the applicable radio interference reduction requirements of MIL-STD-461A for tactical support classification.



1. Captive screw(4)	3. Screw (6)	5. Fluorescent lamp
2. Lens assembly	4. Light Assembly	6. Fluorescent lamp

Figure 4-12. Fluorescent Light Assembly-Disassembly (Sheet 1 of 3)(TS 013752)



7. Terminal board cover
8. Input power leads
9. Nut
10. Washer (2)
11. Ground lead
12. Ballast leads
13. Nut (2)
14. Washer (2)
15. Terminal board
16. Nut (4)
17. Washer (4)
18. Ballast
19. Rivet (8)
20. Lamp clip (8)
21. Grommet
22. Light box

Figure 4-12. Fluorescent Light Assembly - Disassembly (Sheet 2 of 3)(TS013753)

conducted and radiated RFI (Radio Frequency Interference) and do not produce audible noise of an objectionable level. The interconnecting wiring for the lights are contained in separate raceways for radio noise shielding purposes. All replacement fluorescent lighting components must be of the same type or part number as the replaced components.

4-16. Replacement of Suppression Components

a. Removal.

(1) Turn off input power to fluorescent light assembly by pulling out area light circuit breaker.

(2) Loosen captive screws (1, fig. 4-12, sheet 1 of 3) and remove lens assembly (2) exposing interior of light assembly (4).

WARNING

In the event of lamp breakage, care must be taken in the removal of broken glass fragments and white phosphorous dust that may be dispersed within the fixture. Excessive inhalation of phosphorous dust must be avoided.

(3) Carefully remove two fluorescent lamps (5 and 6) by disconnecting ballast leads.

(4) Remove terminal board cover (7, fig. 4-12, sheet 2 of 3), disconnect input power leads (8), and ground lead (11) by removing nut (9) and washer (10).

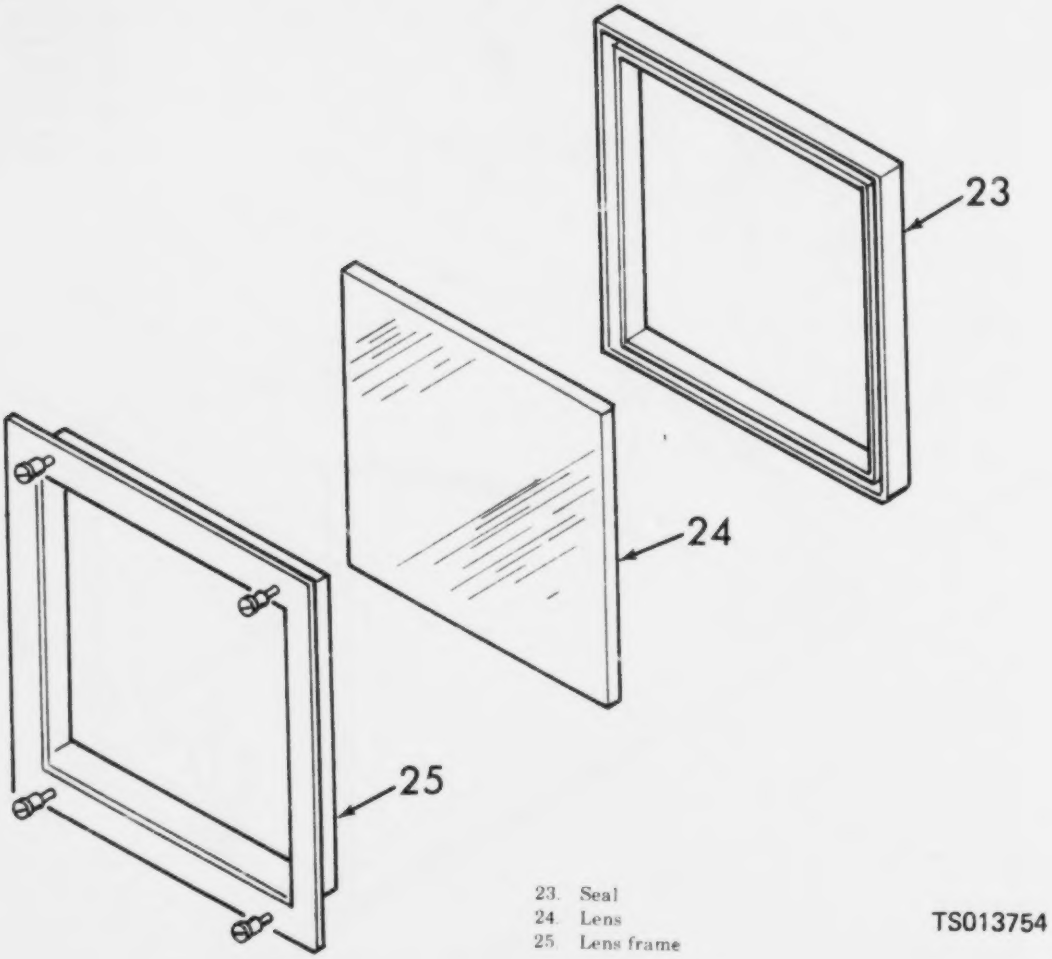


Figure 4-12. Fluorescent Light Assembly - Disassembly (Sheet 3 of 3) (TS 013754)

(5) Remove screws (3, fig. 4-12, sheet 1 of 3) and pull out light assembly (4) for repair or replacement on bench or table top.

b. ***Disassembly.*** Disassemble fluorescent light assembly (4, fig. 4-12, sheet 1 of 3) to repair or replace damaged parts by observing sequence of index numbers assigned to figure 4-12, and observing the following:

(1) Disconnect ballast leads (13, fig. 4-12, sheet 2 of 3) from terminal board (15).

(2) Remove nuts (13), washers (14) and remove terminal board (15).

(3) Remove nuts (16), washers (17) and remove ballast (18).

(4) Remove lamp clips (20) by removing rivet (19).

(5) Remove grommet (21) from light box (22).

(6) Remove seal (23, fig. 4-12, sheet 3 of 3) and lens (24) by peeling from cemented area of lens frame (25).

c. ***Assembly.*** Use figure 4-12 as a guide to assembly the light assembly and observe the following:

(1) Cement seal (23, fig. 4-12, sheet 3 of 3) and lens (24) using the two part adhesive from the repair kit.

Figure 4-12 (Sheet 4 of 5) DELETED

(2) Ensure that the ballast black lead is connected to the 120 vac, 400 hz terminal and the white lead is connected to the ac return on the terminal board (15, fig. 4-12, sheet 2 of 3).

b. ***Installation.*** Using figure 4-12 as a guide, install the light assembly as follows:

(1) Push input power leads (8, fig. 4-12, sheet 2 of 3) and ground lead (11) through grommet (21). Observing polarity, install input power and ground leads.

(2) Align holes in light assembly (4, fig. 4-12, sheet 1 of 3) with insert holes in the roof panel and install screws (3).

(3) Install and connect fluorescent lamps (6 and 5). Ensure that the two lamps are securely seated in retaining clips (20, fig. 4-12, sheet 2 of 3).

(4) Install lens assembly (2, fig. 4-12, sheet 1 of 3) by tightening captive screws (1).

(5) Turn on input power to fluorescent light assembly by pushing in area light circuit breaker.

Figure 4-12 (Sheet 5 of 5) DELETED

4-17. Testing of Radio Interference Suppression Components

Test the ballast transformer and electric wiring for shorts and leaks using a multimeter or other suitable test equipment. Replace defective ballastor wiring. If test equipment is not available and interference is indicated; isolate the cause for interference by the trial and error method of replacing each component in turn until the cause of interference is located and eliminated.

Section VII. MAINTENANCE OF ELECTRICAL SYSTEM

4-18. General

This section provides instructions for repair and replacement of those items considered as part of the electrical system. The electrical system consists of a power distribution box assembly, a 60 Hertz power input cable assembly, a 400 Hertz power input cable assembly, an air-lock light assembly, twelve convenience receptacles, six fluorescent lamps assemblies, power input and output panels and a light switch.

WARNING

Personnel must observe extreme caution to avoid contact with electrical circuits when power source is connected. In case of accident from electrical shock, disconnect power source at once. If power source cannot be disconnected, free victim from live conductor with a board or other nonconductor. If victim is unconscious, apply artificial respiration and obtain medical help.

4-19. 60 Hertz and 400 Hertz Power Input Cable Assemblies

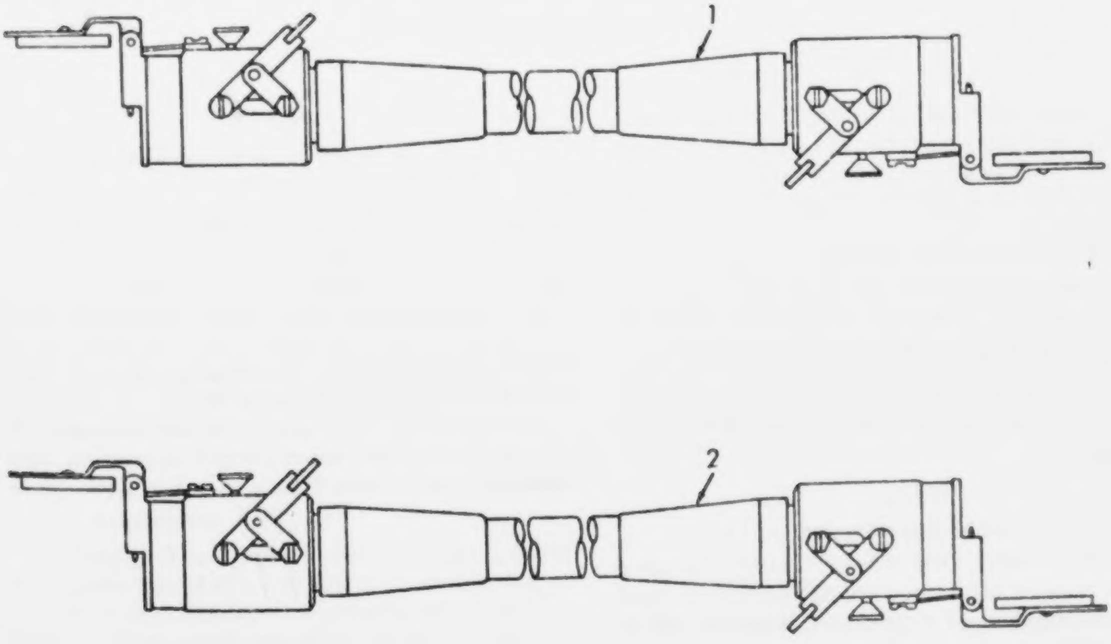
a. Removal. Disconnect cable assemblies (1 and 2, fig. 4-13) from power source and power inlet and power outlet panel assemblies (fig. 4-14).

b. Cable Assembly Test. Check continuity of cable assembly wires using a continuity light, multimeter, or other continuity checking device. Continuity must not exist between terminals and connector or between wires. Continuity must exist between connectors (wire terminal to wire terminal). If continuity check indicates a damaged or defective cable, replace cable.

c. Installation. Connect cable assemblies (1, 2, fig. 4-13) to power source and to power inlet or outlet panel assemblies (fig. 4-14 and 4-15).

4-20. Air Lock Light Assembly

a. Removal. Disconnect cable assembly for light assembly (5, fig. 4-16) from air lock light receptacle on power inlet or outlet panel and remove light assembly from hook in air lock chamber.



1. 60 Hertz power cable assembly
2. 400 Hertz power cable assembly

Figure 4-13. Electric Power Cable Assemblies (TS 013757)

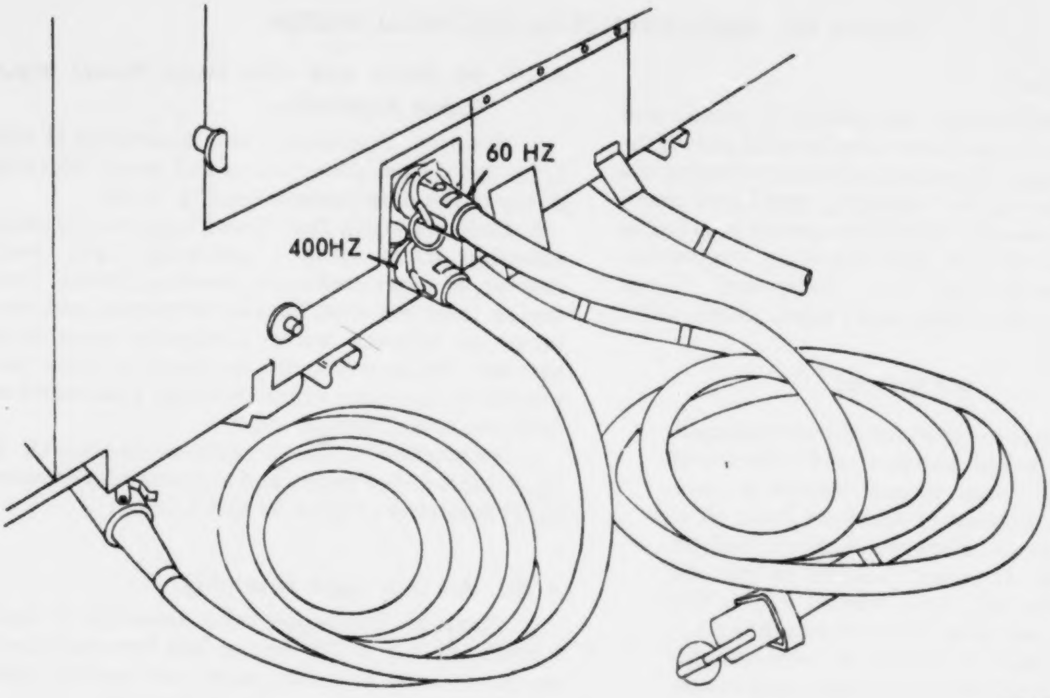


Figure 4-14. Power Input Panel (TS 013758)

b. *Air Lock Light Assembly Test.* Check continuity of light assembly using a continuity light, multimeter or other continuity checking device.

c. *Disassembly.* Disassemble light assembly for replacement of lamp or guard according to sequence of index numbers assigned to figure 4-16.

d. *Assembly.* Assemble guard (4, fig. 4-16) and lamp (1) to light assembly in reverse order of disassembly and using figure 4-16 as a guide.

e. *Installation.* Install light assembly (5, fig. 4-16) on hook in air lock chamber and connect cable assembly to power inlet or outlet panel, whichever is convenient.

4-21. Convenience Receptacles

a. *Convenience Receptacle Inspect.* Remove receptacle cover and inspect for damaged or burned terminals. Replace or repair any damaged receptacle covers.

b. *Convenience Receptacle Test.* Check continuity of receptacle wires using a continuity light, multimeter (para 11-2), or other continuity checking device.

NOTE

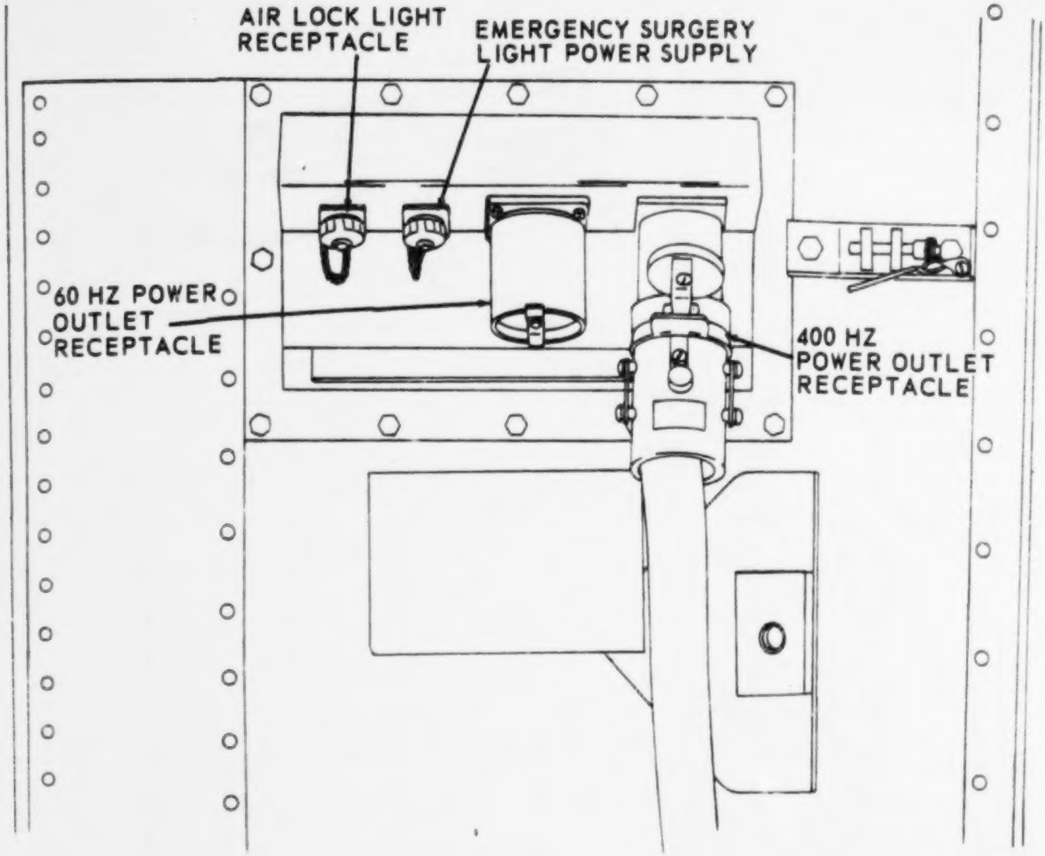
Refer any defects found during above test to direct support maintenance level.

4-22. Fluorescent Light Assemblies

a. *Removal.* Refer to paragraph 4-16*a*, steps (1) thru (5) and use figure 4-12 as a guide.

b. *Disassembly.* Disassemble fluorescent light assembly (4, fig. 4-12, sheet 1 of 3) to repair or replace damaged parts by observing sequence of index numbers assigned to figure 4-12.

c. *Assemble.* Use figure 4-12 and paragraph 4-16c as a guide and assemble the fluorescent light assembly.


AIR LOCK LIGHT RECEPTACLE
EMERGENCY SURGERY LIGHT POWER SUPPLY
60 HZ POWER OUTLET RECEPTACLE
400 HZ POWER OUTLET RECEPTACLE

TS013759

Figure 4-15. Power Output Panel Assembly (TS 013759)

d. Installation. Install fluorescent light assembly in reverse order of removal using figure 4-12 as a guide.

4-23. Power Input and Power Output Panel Assemblies

a. General. The input and output panel assemblies consist of a 400 Hertz input and output connectors and a 60 Hertz input and output connectors. The input panel assembly is mounted adjacent to the water box assembly at the bottom center of the front fixed end panel. The output assembly is mounted midway up the rear fixed end panel assembly adjacent to the access door (figs. 4-14 and 4-15).

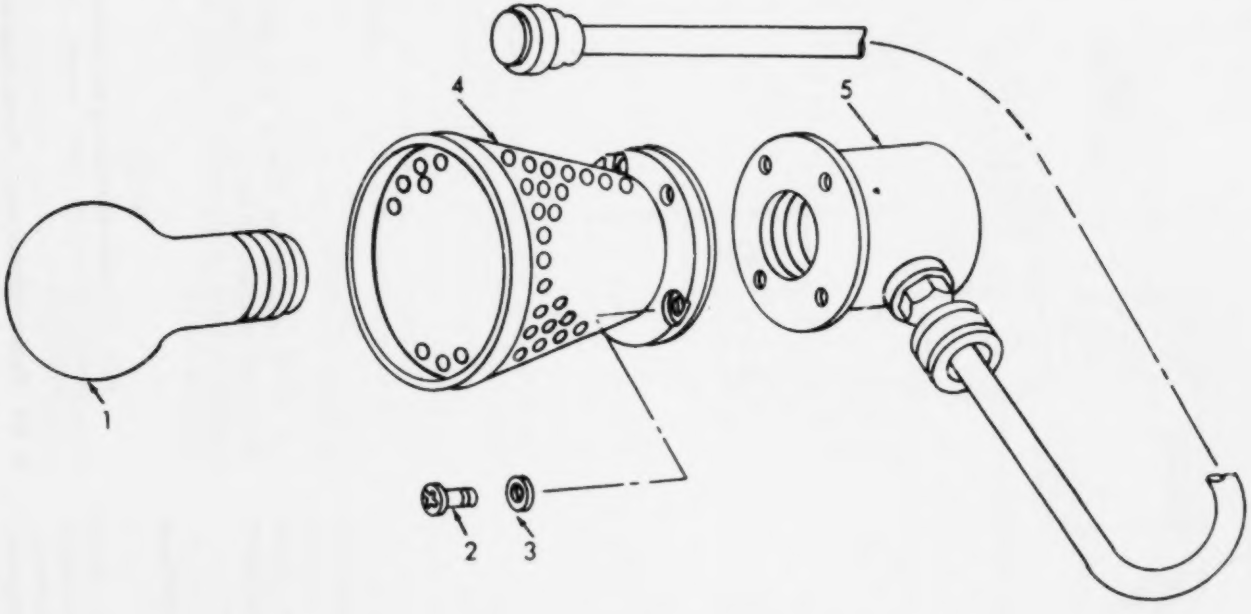
b. Panel Assemblies Test. Check continuity of input and output connectors and cables using a continuity light, multimeter or other continuity checking device.

NOTE

Refer any defects found during the above continuity checks to direct support level maintenance.

4-24. Power Distribution Panel Assembly

a. General. The power distribution panel assembly is mounted above the rear access door. It contains the shelter circuit breaker panel, and emergency light, terminal boards and wire and harness assemblies (fig. 4-17).



TS013760

1. Lamp
2. Screw
3. Washer
4. Guard
5. Light assembly

Figure 4-16. Air Lock Light Assembly, Partial Disassembly (TS 013760)

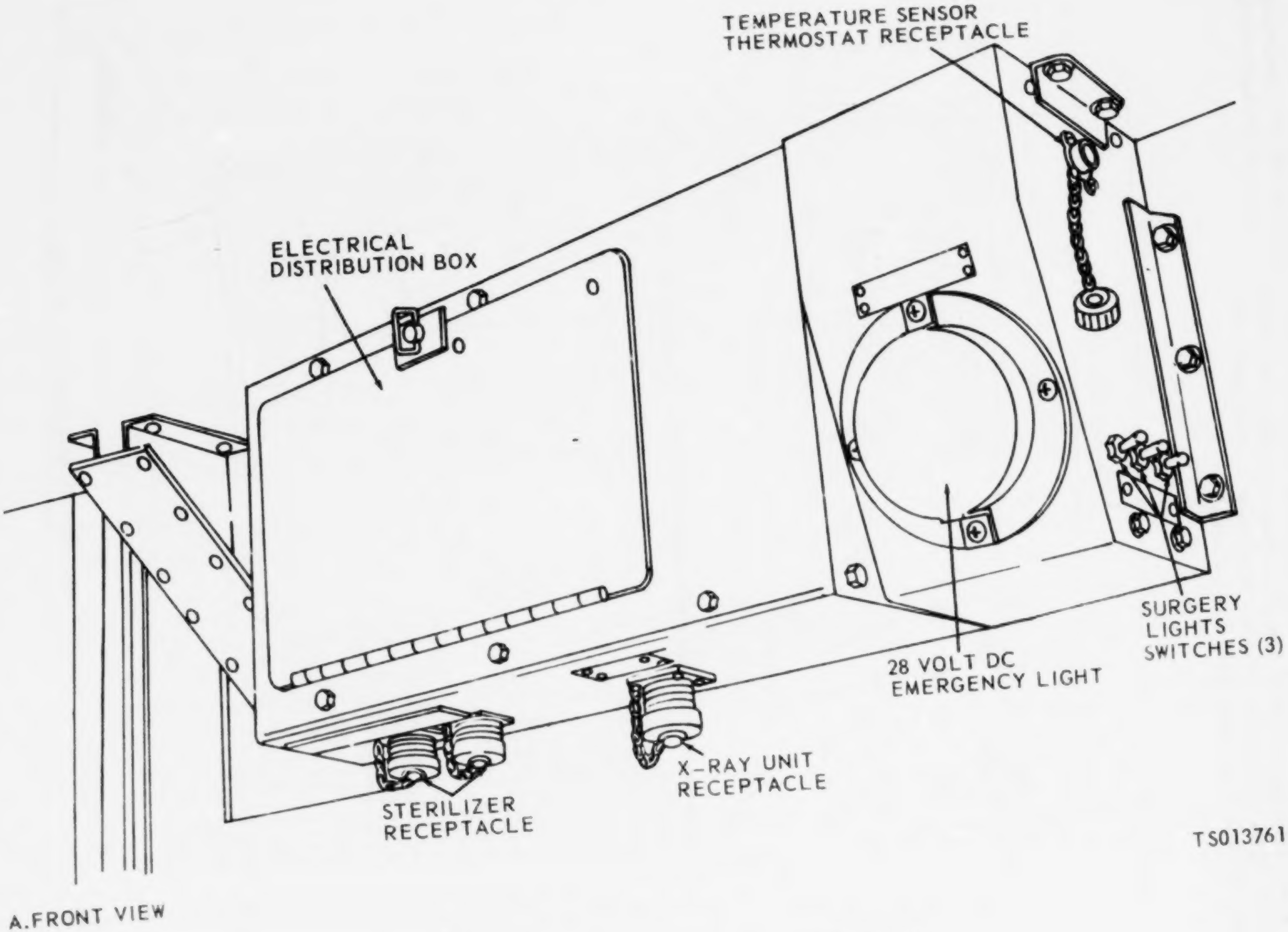
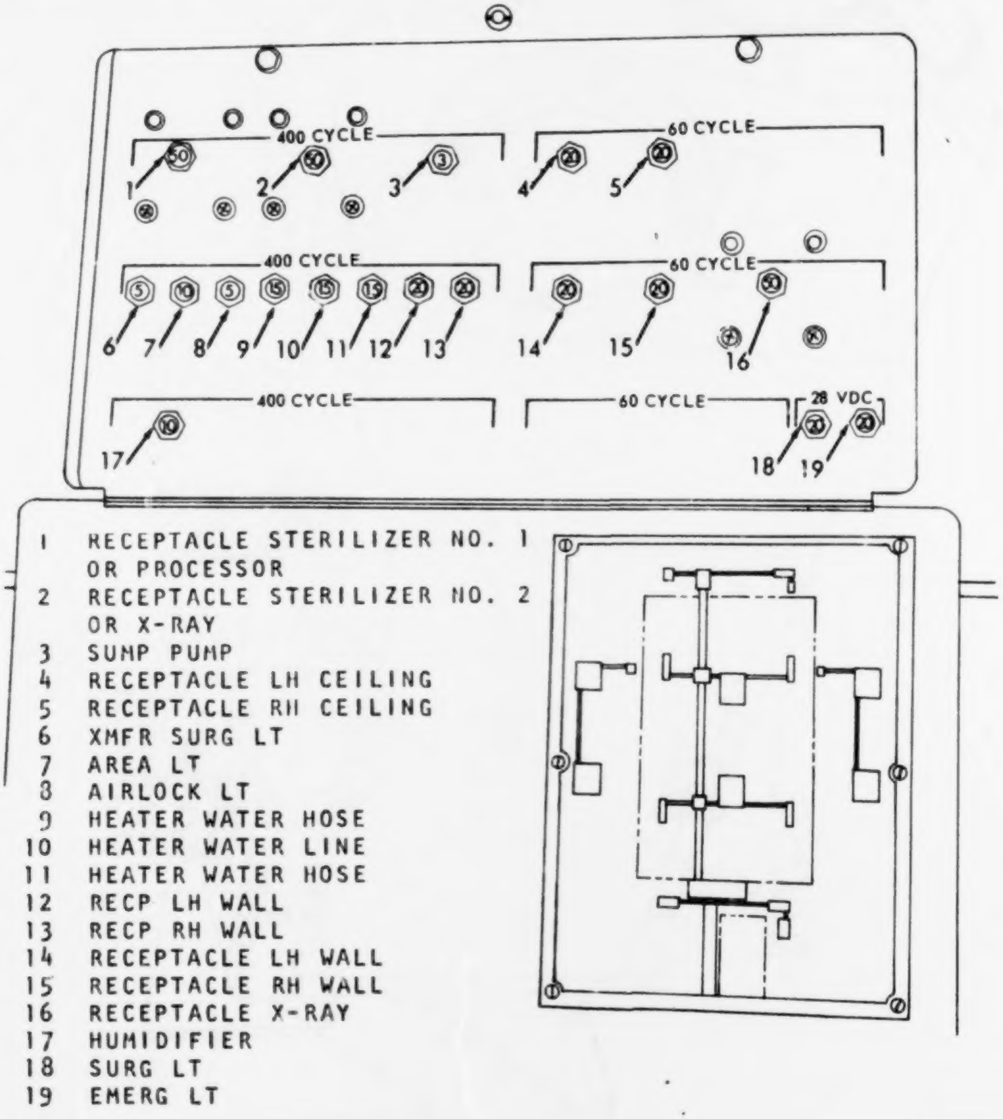

TEMPERATURE SENSOR
THERMOSTAT RECEPTACLE
ELECTRICAL
DISTRIBUTION BOX
SURGERY
LIGHTS
SWITCHES (3)
28 VOLT DC
EMERGENCY LIGHT
X-RAY UNIT
RECEPTACLE
STERILIZER
RECEPTACLE
TS013761
A.FRONT VIEW

Figure 4-17. Power Distribution Panel Assembly (Sheet 1 of 3) (TS 013761)

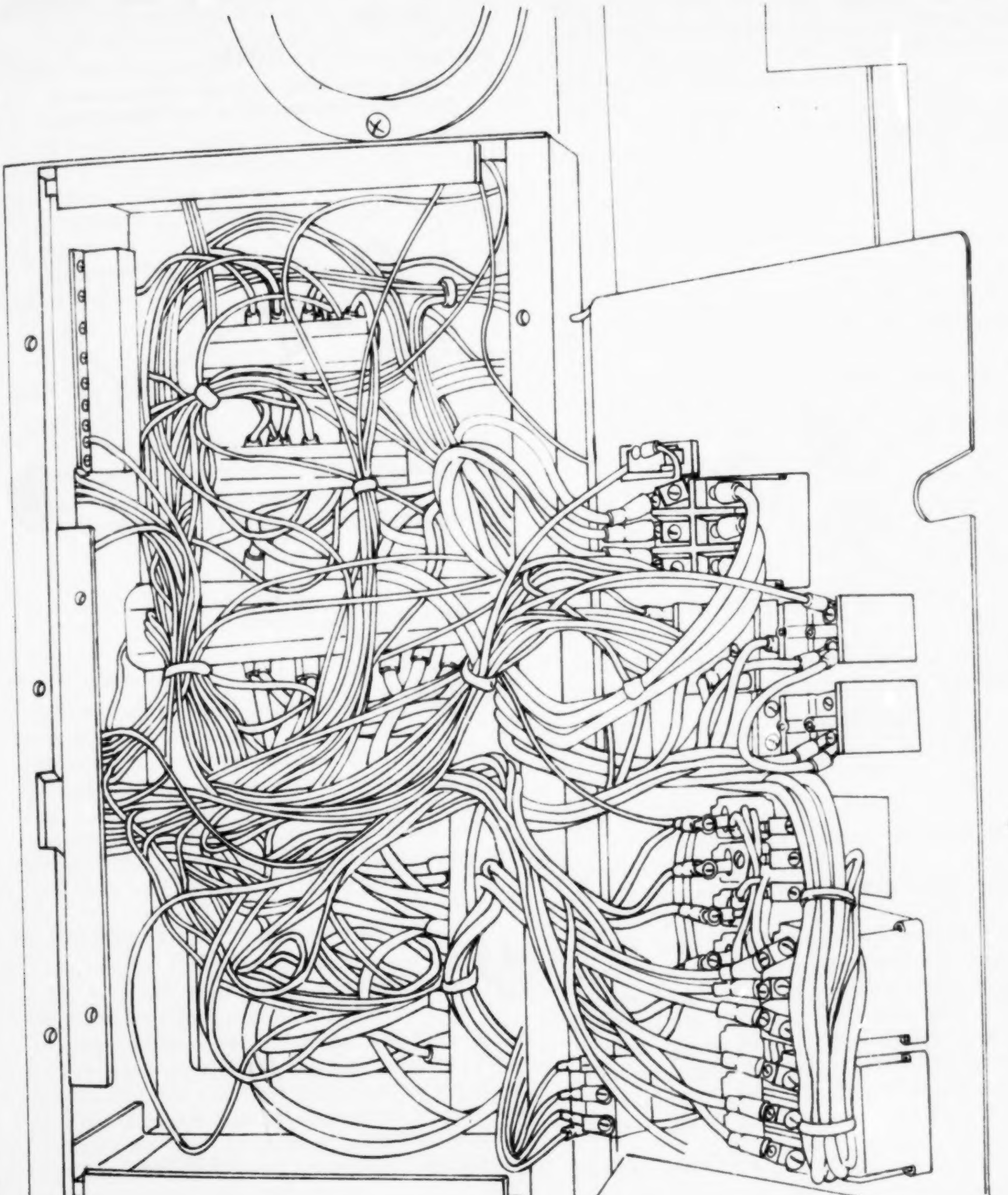
b. Power Distribution Panel Assembly Test. Check continuity of panel assembly using a continuity light, multimeter or other continuity checking device. Continuity must exist through wire and cable assemblies and their connectors and terminal boards. Replace any damaged or missing receptacle covers.


400 CYCLE
60 CYCLE
400 CYCLE
60 CYCLE
400 CYCLE
60 CYCLE
28 VDC
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

1	RECEPTACLE STERILIZER NO. 1 OR PROCESSOR
2	RECEPTACLE STERILIZER NO. 2 OR X-RAY
3	SUMP PUMP
4	RECEPTACLE LH CEILING
5	RECEPTACLE RH CEILING
6	XMFR SURG LT
7	AREA LT
8	AIRLOCK LT
9	HEATER WATER HOSE
10	HEATER WATER LINE
11	HEATER WATER HOSE
12	RECP LH WALL
13	RECP RH WALL
14	RECEPTACLE LH WALL
15	RECEPTACLE RH WALL
16	RECEPTACLE X-RAY
17	HUMIDIFIER
18	SURG LT
19	EMERG LT

TS013762

Figure 4-17. Power Distribution Panel Assembly (Sheet 2 of 3) (TS 013761)



TS013763

Figure 4-17. Power Distribution Panel Assembly (Sheet 3 of 3) (TS 013763)

Section VIII. MAINTENANCE OF CONDITIONED AIR SYSTEM

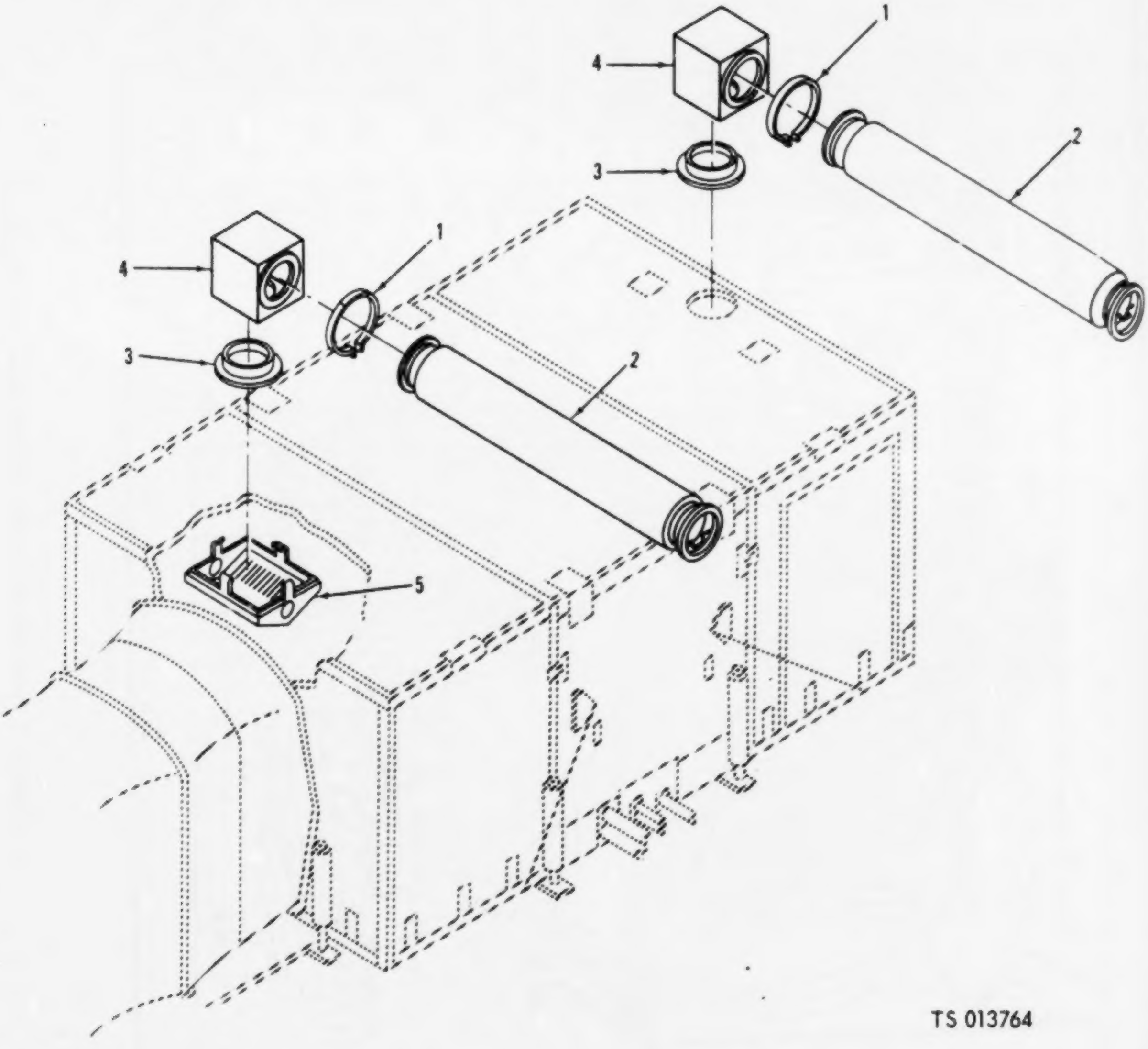
4-25. General

This section provides instructions for repair and replacement of those items considered as part of the conditioned air system. They consist of two air duct assemblies, two air duct assemblies, two air duct adapter assemblies, coupling clamps and air conditioning plenum assembly (fig. 4-18).

4-26 Air Duct Assemblies and Coupling Clamps

NOTE

Repair minor holes, tears and other damage to fabric of air duct assembly as described in Section XI.



1. Air duct clamps (2)
2. Conditioned air duct (2)
3. Flange assembly (2)
4. Air duct adapter (2)
5. Air distribution plenum

Figure 4-18. Conditioned Air System, Removal (TS 013764)

a. Removal.

(1) Disconnect air duct assemblies (2, fig. 4-18) from source of conditioned air.

(2) Loosen coupling clamp (1) and disconnect air duct assemblies (2) from air duct adapter (4). Remove coupling clamps (1) and air duct assemblies (2).

b. Installation.

(1) Install duct assembly (2, fig. 4-18) at conditioned air inlet flange on air duct adapter (4) and secure with coupling clamp (1).

(2) Position duct assembly (2) along roof panel and secure.

(3) Connect duct assemblies (2) to source of conditioned air.

4-27. Air Duct Adapter

a. Removal.

(1) Climb up on shelter roof. Unfasten lattches securing flange assembly (3, fig. 4-18) to air inlet and outlet ports and remove adapter (4).

(2) Loosen air duct adapter cuff clamp and remove flange assembly (3) from adapter assembly (4).

b. Installation. Using figure 4-18 as guide, install the air duct adapter as follows:

(1) Insert the bead side of flange assembly (3, fig. 4-18) inside the air duct adapter (4) past the cuff clamp. Tighten the cuff clamp using the thumb screw.

(2) Install the air duct adapters (4) over the inlet and outlet air ports. Orient adapter with open side toward conditioned air source and secure with latches on flange assembly (3).

4-28. Conditioned Air Distribution Plenum

a. Removal.

(1) Open zipper on air distribution plenum (5, fig. 4-18) and unfasten latches on flange assembly (3).

(2) Remove air distribution plenum (5).

b. Installation.

(1) Position air distribution plenum (5, fig. 4-18) at port selected as inlet port.

(2) Secure plenum (5) with latches on flange assembly (3).

Section IX. MAINTENANCE OF SHELTER ACCESSORIES

4-29. General

This section provides instructions for repair and replacement of those items considered as accessories to the expandable shelter. The expandable shelter accessories consists of the guy line slips, guy line ropes, ground anchors (arrowhead anchors), air lick chamber, air lick adapter, bellows adapter, tread plate, shelter jack assemblies and cargo tiedown components (fig. 4-19.)

4-30. Guy Line Slips and Line Ropes

a. Removal. Remove guy line rope tension on slip (1, fig. 4-19) and untie knot in rope (2) to permit rope end to pass through eyes of slip (1).

b. Installation. Pass end of guy line rope (2, fig. 4-19) through eye of slip (1) through tie down ring on air-lock chamber and then through other eye of slip (1). Tie a suitable knot in rope (2) to prevent end from slipping back through eye. Tighten guy line rope (2) by pulling downward on slip (1), slip secures the rope position when released.

4-31. Ground Anchors and Cable Assemblies

a. Removal. Release tension on guy line rope (2, fig. 4-19) to cable assembly (3). Remove cable clamps and loop on one end of cable assembly (3) and pull cable assembly (3) through slots in installed ground anchor (5). Replace hook in end of cable assembly (3) and install cable clamps to secure.

NOTE

Ground anchors are expendable items and are not removed after installation.

b. Installation.

(1) Use driving rod and holder from inflatable Shelter Erection Kit.

(2) Install cable assembly (3, fig. 4-19) in grooves in ground anchor (5).

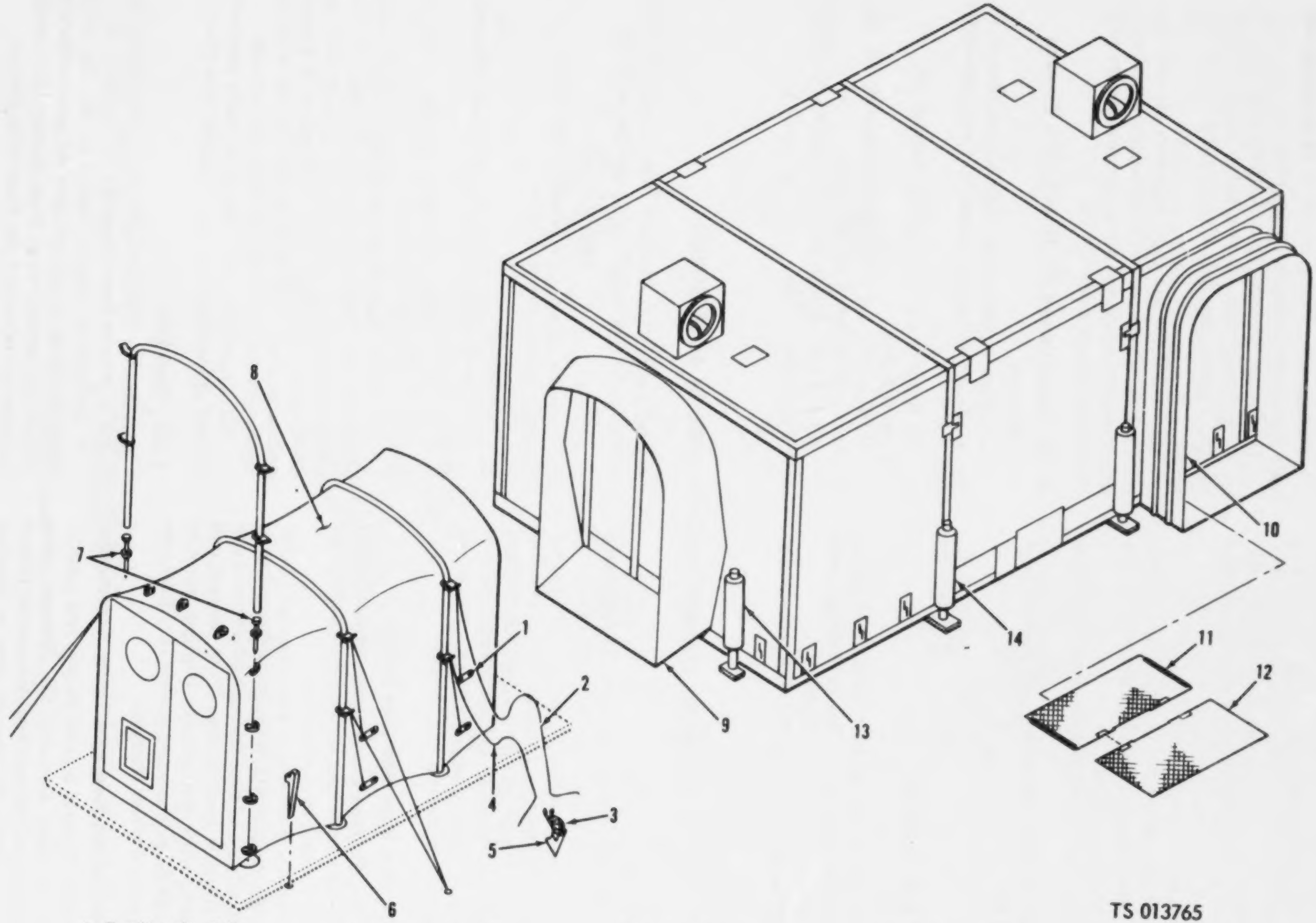
(3) Insert shaft of ground anchor in hole in end of driving rod. Place holder over rod to hold rod. Use sledge hammer to drive anchor into ground approximately two feet deep with point of ground anchor angled away from shelter in line with the applicable guy line rope (2) from the air lock.

(4) Attach guy line rope (2) to cable assembly (3) and tighten guy line rope with guy line slip (1).

4-32. Tent Pins

a. Removal. Pull straight out on tent pin (6, fig. 4-19) to remove from ground.

b. Installation. Install tent pin (6, fig. 4-19) through O-ring on air lock ground apron with tang on tent pin pointed away from shelter. Use a sledge hammer to drive tent pin flush with ground.



1. Guy line slip (14)
2. Guy line rope (8)
3. Cable assembly (14)
4. Guy line rope (6)
5. Ground anchor (14)
6. Tent pin (6)
7. Bow-spike (6)
8. Air lock chamber
9. Air lock adapter
10. Bellows adapter
11. Tread plate, upper
12. Tread plate, lower
13. Jack assembly (4)
14. Jack assembly (4)

Figure 4-19. Shelter Accessories, Disassembly (TS 013765)

4-33. Air Lock Chamber

NOTE

Repair holes, tears and other damage to fabric of air lock chamber as described in Section XI.

a. Removal.

(1) Disconnect cable assembly for light assembly (see fig. 4-16) from airlock light receptacle on power inlet or outlet panel and remove light assembly from hook in air lock chamber.

(2) Disconnect air lock chamber guy line ropes (2, 4, fig. 4-19) from cable assemblies (3).

NOTE

Remove tent pins (6) used to secure air lock chamber ground apron. Remove cable assemblies as described in paragraph 4-31 *a.* if replacement chamber is not to be installed at the same location.

(3) Open and disengage zipper between air lock chamber (8) and chamber adapter (9).

(4) Life up on bow assemblies (1 through 8, fig. 4-20) to free bow assemblies from bow spikes (7, fig. 4-19). Remove bow spikes from ground. Remove air lock chamber (8).

b. Disassembly Disassemble air lock chamber as required to replace damaged components as shown in figure 4-20 and observing the following:

(1) Remove retaining pin (1, fig. 4-20) to separate bows (8).

(2) Remove rivet (3) to separate bow support (5).

c. Assembly. Assemble air lock chamber using figure 4-20 as a guide and observing the following:

(1) Install rivet (3, fig. 4-20) to secure bow support (5) to bow (8).

(2) Join bow (8) with bow support (5) and secure with retaining pin (1).

d. Installation.

(1) Position air lock chamber (8, fig. 4-19) adjacent to doors in end panel of shelter. Engage zipper between air lock adapter and air lock chamber and close zipper.

(2) Pull chamber out to full length from shelter entrance. Straighten sod cloth around chamber.

(3) Drive bow spikes (7, fig. 4-19) at base of bows (8, fig. 4-20). Install bows over head of bow spikes.

(4) Isntall tent pin (6, fig. 4-19) through O-ring on air lock ground apron with tang on tent pin pointed away from shelter. Use a sledge hammer to drive tent pin flush with ground.

(5) Install ground anchors (5) and cable assemblies (3) as follows:

NOTE

Ground anchors are expendable items and are not removed after installation.

(a) Use driving rod and holder from inflatable Shelter Erection Kit.

(b) Install cable assembly (3), fig. 4-19) in grooves in ground anchor (3).

(c) Insert shaft of ground anchor in hole in end of driving rod. Place holder over rod to hold rod. Use sledge hammer to drive anchor into ground approxiamtely two feet (60.96 cm) deep with point of ground anchor angled away from shelter in line with the applicable guy line rope (2, fig. 4-19) from the air lock.

(d) Attach guy line rope (2) to cable assembly (3) and tighten guy line rope with guy line slip (1).

(6) Connect air lock chamber guy lines to cable assemblies (3). Tighten guy lines evenly.

(7) Install light assembly on hook in air lock chamber. Connect cable assembly in air lock light receptacle on power inlet or outlet panel.

4-34. Air Lock Adapter

NOTE

Repair holes, tears and other damage to fabric of air lock adapter as described in Section XI.

a. Removal.

(1) Remove fasteners located around edge of adapter (9, fig. 4-19) and loosen drawstring on adapter. Remove pins from lower receptacles.

(2) Remove adapter (9) from air lock chamber by opening and disengaging the zipper between the air lock chamber (8) and chamber adaptor (9).

b. Installation.

(1) Select door to be used as entry-exit door.

(2) Insert pins located at top of adapter, through holes in corresponding straps and into receptacles above door opening on panel.

(3) Place adapter over flame. Pull drawstring so that adapter fits tightly around frame and lock drawstrings in place.

(4) Insert fasteners, located around edge of adapter, into receptacles around face of frame.

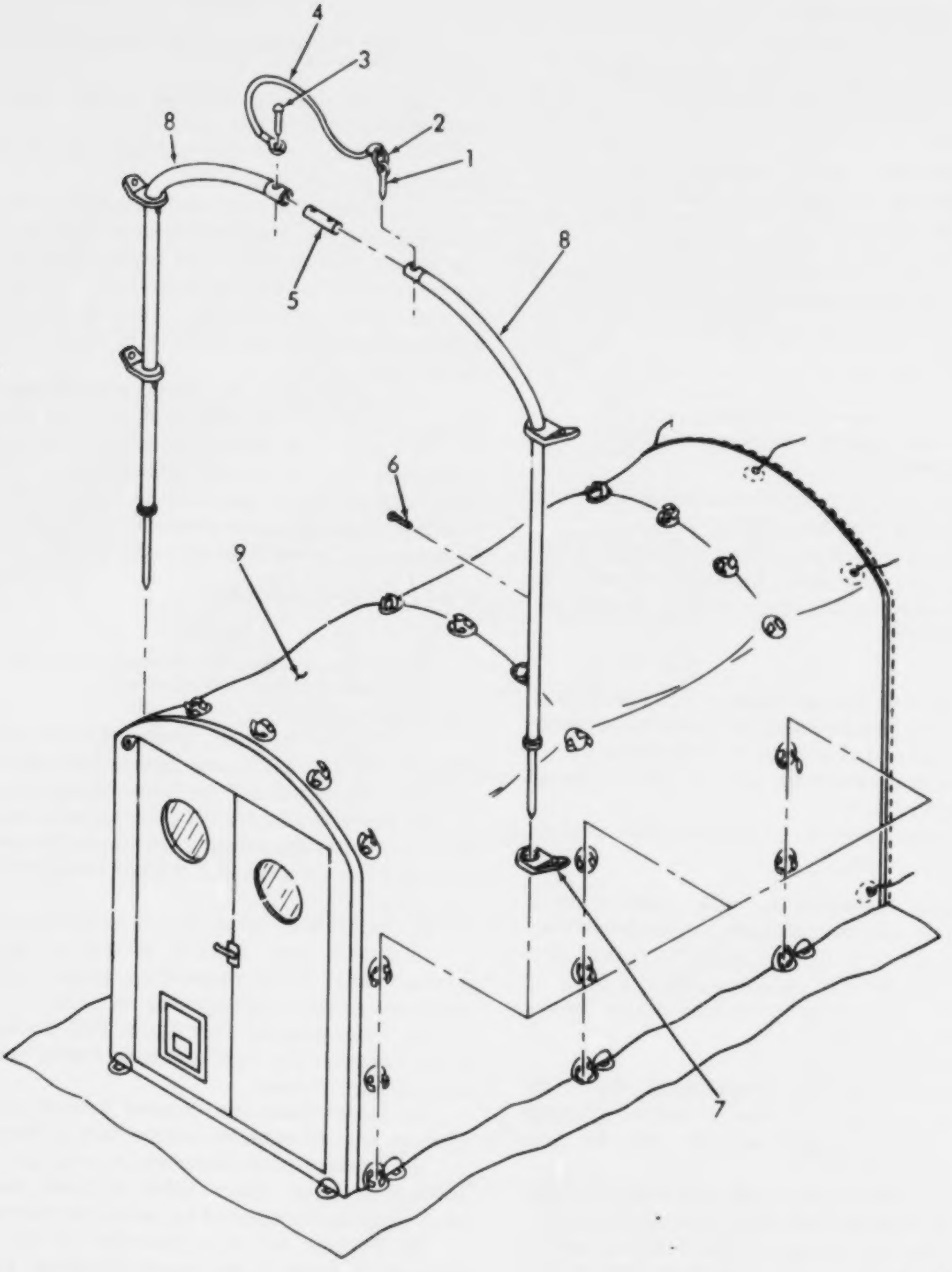
(5) Remove pins installed in step (2) above. Move pins from upper holes to lower holes in corresponding straps and reinsert into receptacles.

(6) Position air lock chamber (8, fig. 4-19) adjacent to doors in end panel of shelter. Engage zipper between air lock adapter (8) and close zipper.

4-35. Bellows Adapter

a. Removal.

(1) Remove metal tread plates (11, 12, fig. 4-19) from mounts below door and slide tread plate (11) away from tread plate (12).



TS013766

1. Retaining pin (3)
2. Retaining pin ring (3)
3. Rivet (3)
4. Retaining pin lanyard (3)
5. Bow support (3)
6. Screw (12)
7. Guy line bracket (12)
8. Bow (6)
9. Air lock chamber

Figure 4-20. Air Lock Chamber, Partial Disassembly (TS 013766)

(2) Remove fasteners, located around edge of frame from receptacles.

(3) Remove pins from lower receptacles and loosen drawstring on adapter and remove bellows adapter (10).

(4) Remove bellows from adjacent shelter observing procedure given in steps (1 through 3) above.

b. Installation.

(1) Insert pins, located at top of bellows, through holes in corresponding straps and into receptacles above door opening on panel.

(2) Place bellows over frame. Pull drawstring so that bellows fits tightly around frame and lock drawstrings in place.

(3) Insert fasteners, located around edge of bellows, into receptacles around face of frame.

(4) Remove pins installed step (1) above. Move pins to lower holes in corresponding straps and reinsert into receptacles.

(5) Attach bellows to adjacent shelter observing procedures given in steps (1 through 4) above, then install metal nonskid tread plates (11, 12, fig. 4-19) into mounts below door openings.

4-35.1. Jack Assemblies

There are two different configurations of jack assemblies available. For maintenance of jacks installed on shelter serial No. 1 through 401, refer to paragraphs 4-36 and 4-37 and for shelter serial No. 402 and subsequent, refer to paragraph 4-37.1. The two configurations are completely interchangeable.

4-36. Jack Assemblies (Fixed End)

NOTE

This paragraph provides maintenance instructions for jacks installed on shelter serial No. 1 through 401.

a. Removal. The fixed end jack assemblies (5, fig. 4-21, sheet 1 of 2) shall be removed as follows:

(1) Remove cotter pin (1) from pin (2) and push pin (2) from hole.

(2) Unscrews bolts (3) from shelter panel and remove nut (4).

b. Disassembly.

(1) Remove the pin (1, fig. 4-22) and remove the stud (2), washer (3) and seal (4) from the retracting tube (14).

(2) Disconnect the wire rope (5) and remove the ratchet (6) from the retracting tube.

(3) Remove the screw (7) and remove the wire rope (8).

(4) Remove the screw (9) and plug (10).

(5) Remove the grommet (11), if replacement is required.

(6) Remove the cotter pin (12) and pin (13) and remove the retracting tube (14) from the plate (17).

(7) Remove the screw (15) and remove the pin assembly (16) from the plate (17).

c. Inspection. Inspect all parts for wear and damage.

d. Repair.

(1) Replace all worn and damaged parts.

(2) Replace an irreparable jack assembly.

e. Assembly.

NOTE

During reassembly lubricate all moving parts with a suitable high-temperature water-resistant grease (NLGI #2) automotive chassis lubricant is satisfactory.

(1) Install the pin assembly (16, fig. 4-22) on the plate (17) and secure with screw (15).

(2) Install the retracting tube (14) on the plate (17) and secure with pin (13) and cotter pin (12).

(3) Install a new grommet (11), if removed.

(4) Install the plug (10) and screw (9).

(5) Install the wire rope (8) and secure with screw (7).

(6) Install the ratchet (6) and wire rope (5).

(7) Install the seal (4), washer (3) and stud (2) onto the retracting tube (14) and secure with pin (1).

f. Installation. Using figure 4-21 as a guide, install the jack assembly as follows:

(1) Screw retainer nut (4, fig. 4-21, sheet 1 of 2) onto bolt (3).

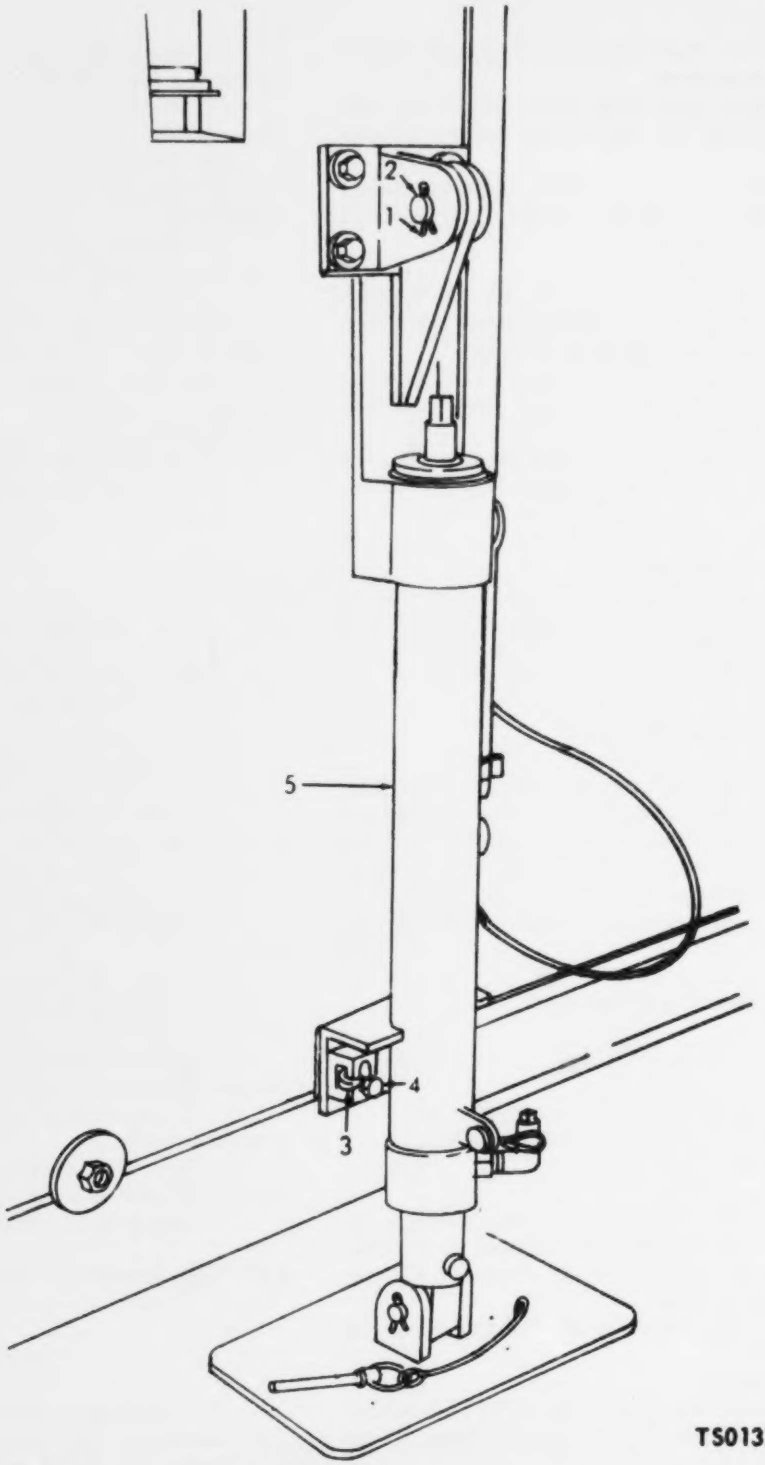
(2) Place jack assembly (5) into position and insert pin (2) into hole and install new cotter pin (1).

(3) Secure jack to shelter with bolts (3).

4-37. Jack Assembly (Folding Floor)

NOTE

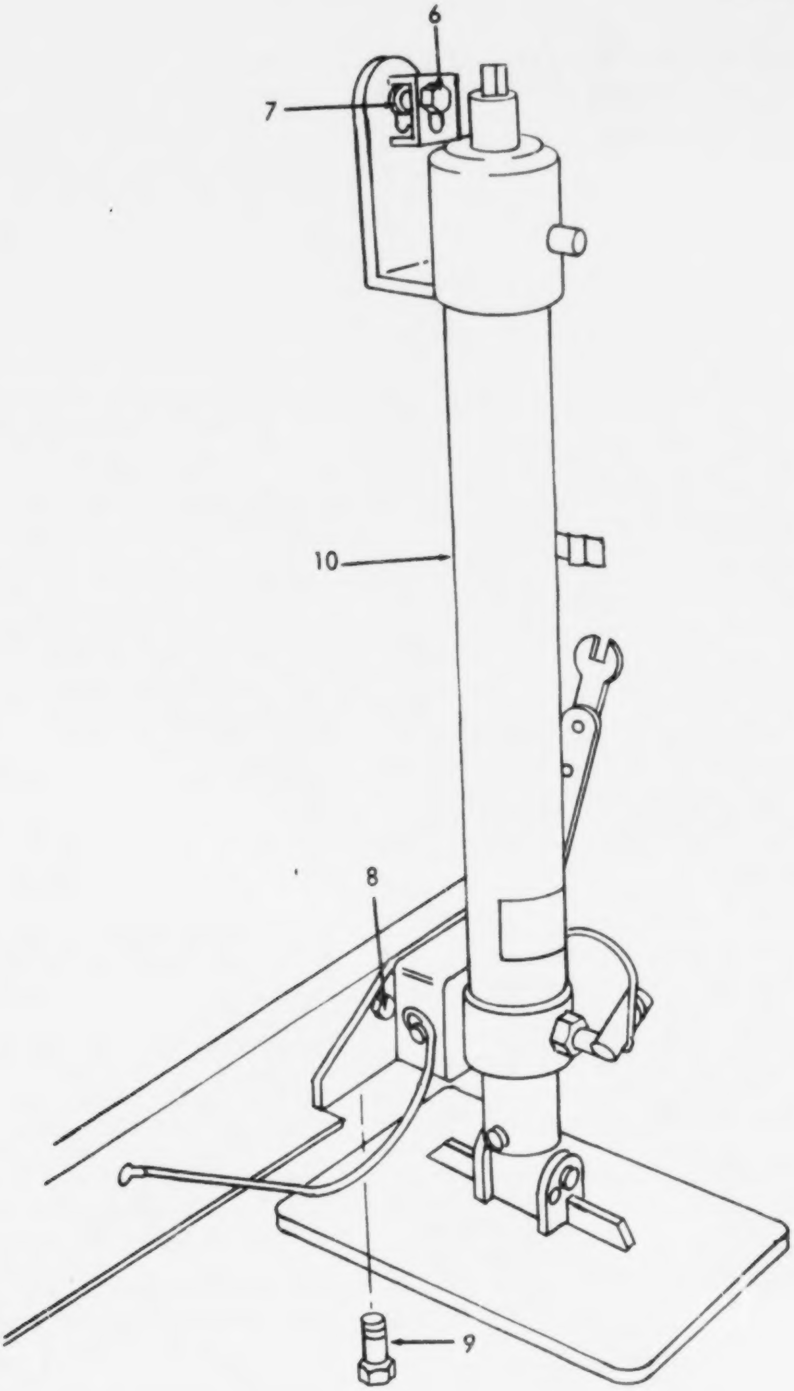
This paragraph provides maintenance instructions for jacks installed on shelter serial No. 1 through 401.



TS013767

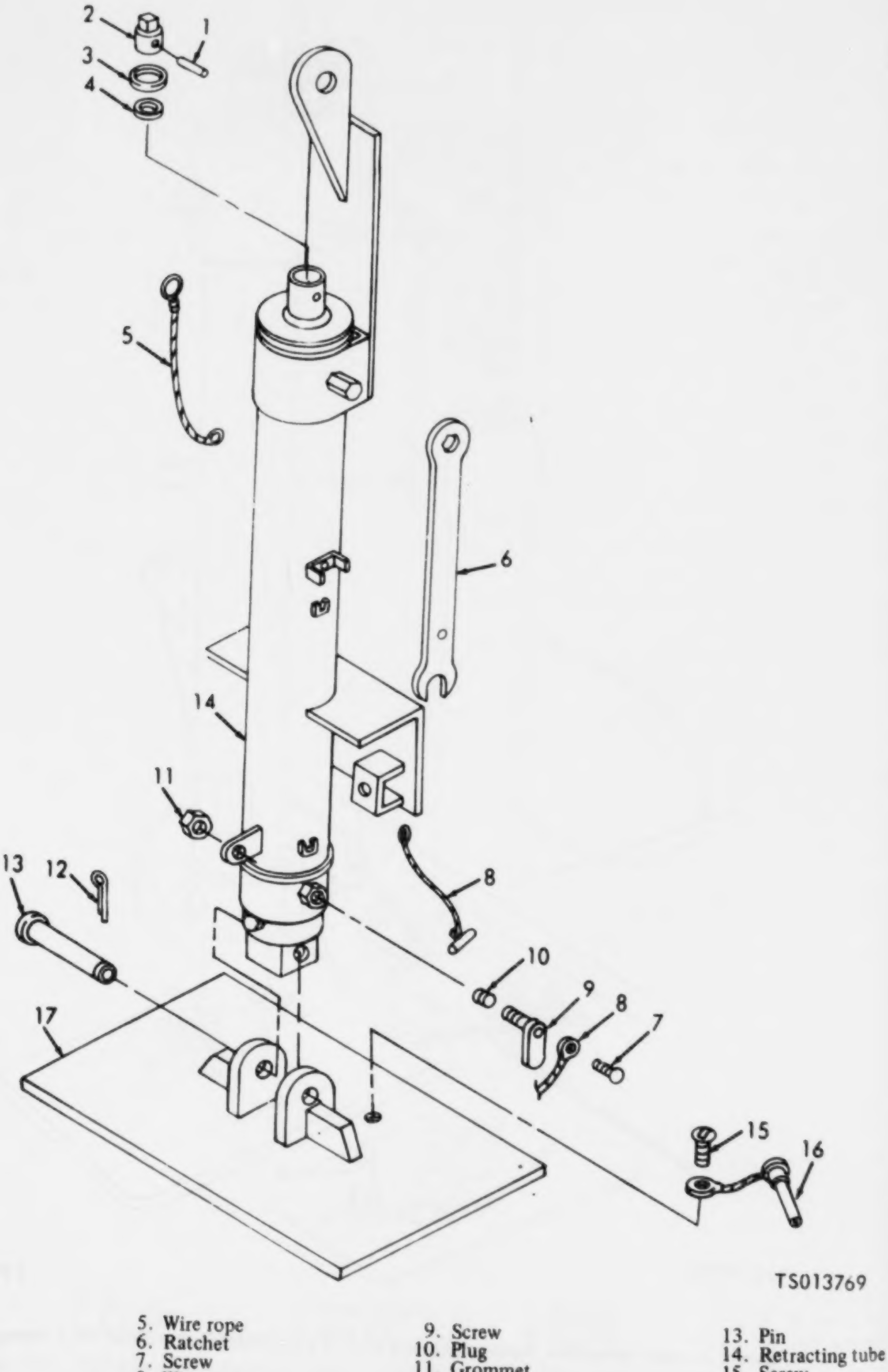
1. Cotter pin (4)
2. Pin (4)
3. Bolt (8)
4. Nut (8)
5. Jack assembly (4)
6. Bolt (4)
7. Nut (4)
8. Bolt (8)
9. Screw (16)
10. Jack assembly (4

Figure 4-21. Jack Assemblies, Removal (Sheet 1 of 2) (TS 013767) (Shelter Serial No. 1 through 401)



TS013768

Figure 4-21. Jack Assemblies, Removal (Sheet 2 of 2) (TS 013768) (Shelter Serial No. 1 through 401)


1
2
3
4
5
6
14
11
13
12
8
10
9
8
7
17
15
16
TS013769

1. Pin
2. Stud
3. Washer
4. Seal
5. Wire rope
6. Ratchet
7. Screw
8. Wire rope
9. Screw
10. Plug
11. Grommet
12. Cotter Pin
13. Pin
14. Retracting tube
15. Screw
16. Pin assembly

Figure 4-22. Jack Assembly, Disassembly and Reassembly (TS 013769) (Shelter Serial No. 1 through 401)

a. Removal. Jack assembly (10, fig. 4-21, sheet 2 of 2) shall be removed, observing the following:

(1) Unscrew bolt (6) from panel and remove nut (7).

(2) Remove bolts (8) from attaching bracket and the four flat head screws (9) from bottom of bracket. Remove jack assembly (10).

NOTE

Disassembly, inspection, repair and assembly instruction listed in paragraph 4-36 are essentially the same for the folding floor jack assembly.

b. Installation. Using figure 4-21 as a guide, install the jack assembly (10, fig. 4-21, sheet 2 of 2) as follows:

(1) Replace retainer nut (7, fig. 4-21, sheet 2 of 2) on bolt (6).

(2) Place jack assembly (10) into position and screw bolt (6) into shelter.

(3) Replace bolt (8) and flat head screws (9) and tighten all bolts and screws securely.

4-37.1. Jack Assemblies (Fixed End and Folding Floor

NOTE

This paragraph provides maintenance instructions for jacks installed on shelter serial No. 402 and subsequent.

a. Removal. Remove fixed end jack assembly as follows:

(1) Remove six cap screws (1, fig. 4-22.1), lockwashers (2) and washers (3) from the upper and lower mounting brackets.

(2) Remove fixed end jack from shelter. Remove folding floor jack assembly as follows:

(1) Remove cap screw (4), washer (5) and jam nut (6) from the upper bracket.

(2) Remove four screw (7) from the mounting plate (47) and remove folding floor jack from shelter.

b. Disassembly.

(1) Remove ferrules (8) as required and disconnect wire rope (9) from ratchet wrench (10). Remove ratchet wrench from its mounting bracket.

(2) On fixed end jack assembly: Remove cotter pin (26) and pin (27) and detach base plate (32).

(3) Remove drive screw (11) and disconnect end terminal (12) as required from wire rope (13). Remove wire rope.

(4) Remove locking screw (14) and pad (15) from outer tube (21).

(5) Drive out spring pin (16) and detach wrenching stud (17), thrust washer (18).

(6) Carefully slide out lower portion of jack away from the outer tube (21) and remove seal (19).

(7) Remove packing (20) and key (25) from the inside of the outer tube (21).

(8) Remove two bearing raceways (22), thrust bearing (23), and bearing support (24) from protruding portion of lifting screw (44).

(9) On folding end jack assembly only: Pull detent pin (28) and detach base plate (32). Remove clip (31), wire rope (30) and ferrules (29).

(10) Remove cotter pin (33), pin (34), and two spacers (35) from inner tube (45). Detach pivot block (36).

(11) Remove cap lug (37) from inside of inner tube (45).

(12) Remove two pins (38), setscrew (39), spring (40), and locking insert (41). Detach lifting nut (42) from inner tube (45).

(13) Remove lifting screw (44) and stop pin (43) from inner tube (45).

NOTE

The following steps pertain to folding end jack assembly only.

(14) Remove four screws (46) and detach mounting plate (47) and spacer blocks (51 and 52).

(15) Remove setscrew (49), nut (50), detent pin (48), and spacer block (53) from outer tube boss.

c. Inspection. Inspect all parts for wear and damage.

d. Repair.

(1) Replace all worn and damaged parts.

(2) Replace an irreparable jack assembly.

e. Assembly.

NOTE

During reassembly, pack lifting screw with approximately 1 oz of MIL-G-23827 Grease.

(1) Install stop in (43) on lifting screw (44).

(2) Screw lifting nut (42) onto lifting screw (44) until threads catch.

(3) Install locking insert (41), spring (40), and setscrew (39).

(4) Install preassembled parts through the top of inner tube (45). Aline holes and install two pins (38).

(5) Install caplug (37) into inner tube (45).

(6) Install pin (34), two spacers (35), and pivot block (36). Secure with cotter pin (33).

(7) On fixed end jack assembly only: Install base plate (32) and secure with pin (27) and cotter pin (26).

(8) On folding floor jack assembly only: Secure wire rope (30) to clip (31) and detent pin (28) with ferrules (29). Install base plate (32) and secure with detent pin (28).

(9) Assemble wire rope (13) and end terminal (12). Secure to locking screw (14) with drive screw (11).

(10) Install wire ropes (13 and 9) and secure with ferrules (8) to outer tube (21) and ratchet wrench (10).

(11) Install packing (20) and key (25) into their respective grooves inside the outer tube (21).

(12) Install bearing support (24), thrust bearing (23), and two bearing raceways (22) onto protruding portion of lifting screw (44).

NOTE

Make certain to place thrust bearing (23) between the two bearing raceways (22).

(13) Aline inner tube spline with key (25) inside the outer tube and slide preassembled components of inner tube into the outer tube. Proceed until lifting screw appears through the opening on the top of outer tube and cannot go any further.

(14) Install seal (19), thrust washer (18) and wrenching stud (17).

(15) Aline wrenching stud holes with holes in the lifting screw and install spring pin (16).

NOTE

The following steps pertain to folding end jack assembly only.

(16) Install, spacer block (53) onto outer tube boss and secure with detent pin (48).

(17) Install nut (50) and secure with setscrew (49).

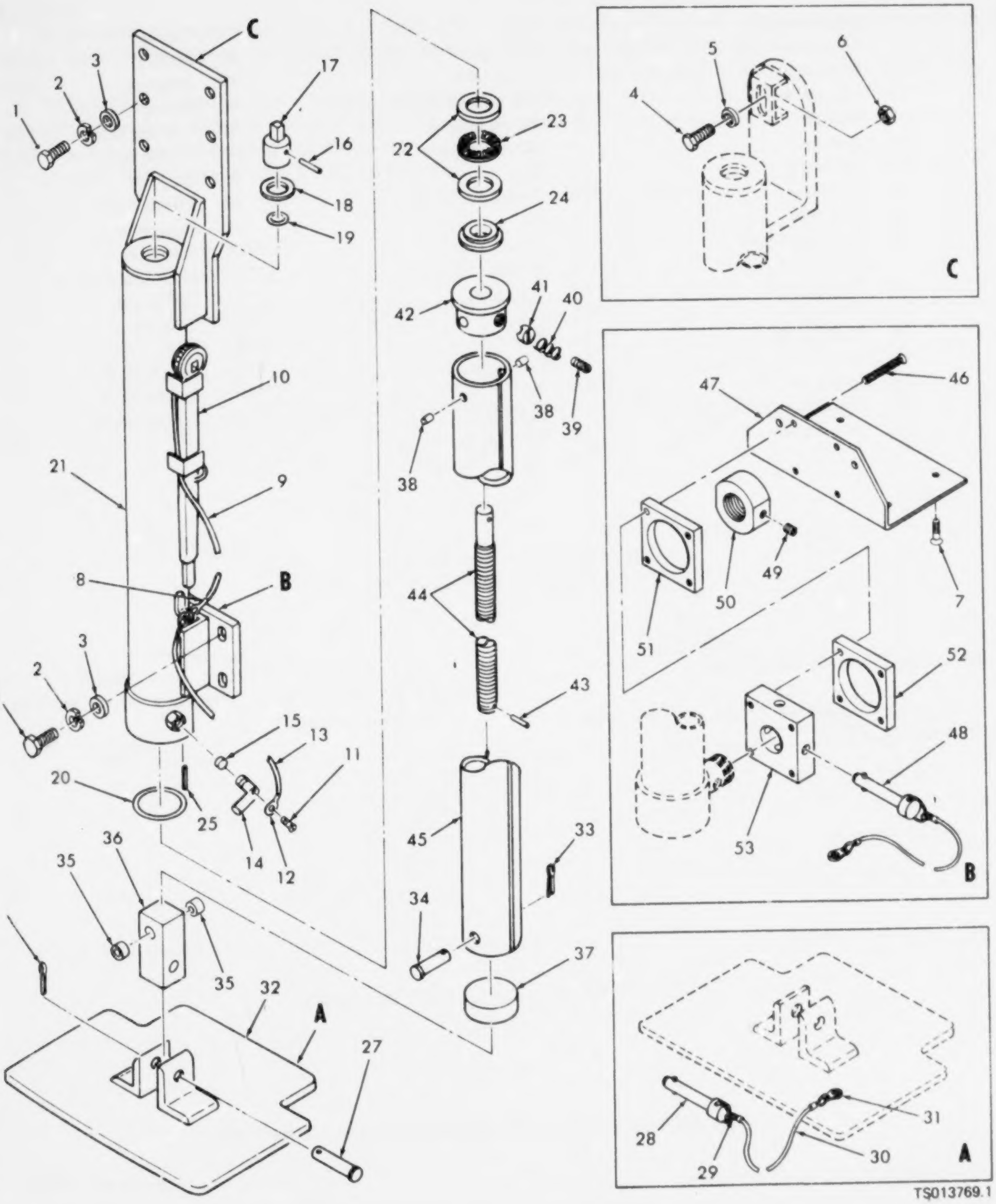
(18) Install spacer blocks (51 and 52) and mounting plate (47), aline mounting holes and secure with four screws (46).

(19) Install cap screw (4), washer (5), and jam nut (6) onto upper portion of jack assembly.

f. Installation.

(1) Fixed end jack assembly only: Position the jack and secure lower bracket using two cap screws (1), lockwashers (2), and washers (3). Install screws and washers through top holes only. Secure top mounting bracket with four cap screws (1), lockwashers (2), and washers (3) through four top holes only.

(2) Folding floor jack assembly only: Position the jack and secure with four screws (7) to the bottom of the floor. Aline with top mounting hole and secure with preassembled cap screw (4).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TS013769.1

Figure 4-22.1. Jack Assembly, Removal, Disassembly and Reassembly (TS013769.1)
(Shelter Serial No. 402 and Subsequent)

KEY to Figure 4-22.1

*1. Cap screw (6)
*2. Lockwasher (6)
*3. Washer (6)
**4. Cap screw
**5. Washer
**6. Jam nut
**7. Screw (4)
8. Ferrule (4)
9. Wire rope
10. Ratchet wrench
11. Drive screw
12. End terminal
13. Wire rope
14. Locking screw
15. Pad
16. Spring pin
17. Wrenching stud
18. Thrust washer
19. Seal
20. Packing
21. Outer tube
22. Bearing raceway (2)
23. Thrust bearing
24. Bearing support
25. Key
*26. Cotter pin
*27. Pin
**28. Detent pin
**29. Ferrule (2)
**30. Wire rope
**31. Clip
32. Base plate
33. Cotter pin
34. Pin
35. Spacer (2)
36. Pivot block
37. Caplug
38. Pin (2)
39. Setscrew
40. Spring
41. Locking insert
42. Lifting nut
43. Stop pin
44. Lifting screw
45. Inner tube
**46. Screw (4)
**47. Mounting plate
**48. Detent pin
**49. Setscrew
**50. Nut
**51. Spacer block
**52. Spacer block
**53. Spacer block

NOTE

*Items installed on fixed end jacks only.
**Items installed on folding floor jacks only.

4-38. Cargo Tiedown Installation

a. Removal. Remove cargo tiedown (fig. 4-23) as follows:

(1) Remove the rope net assembly (3, fig 4-23) by removing the tiedown ropes securing it to the strap assembly (1).

(2) Remove the web net assembly (2) from the cargo top.

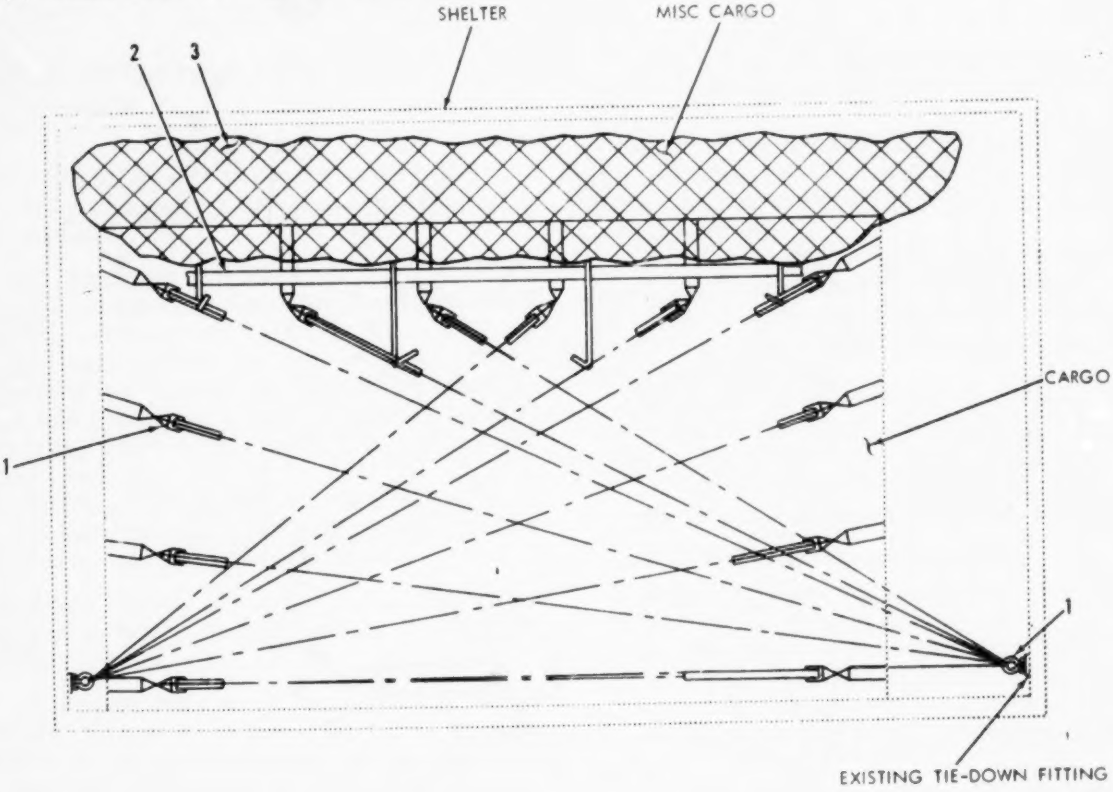
(3) Remove the strap assembly (1) from the shelter tiedown fitting by disconnecting the metal ring.

b. Installation. Install the cargo tiedown assembly in reverse order of removal using figure 4-23 as a guide and observing the following:

(1) Attach the metal ring of the strap assembly (1, fig. 4-23) to the shelter tiedown fittings and tighten the strap assembly.

(2) Place the web net assembly (2) over the cargo and fasten securely.

(3) Place miscellaneous cargo on top of main cargo and secure with the rope net assembly (3) using the strap assembly (1) as a means of attachment.



TS 013770

1. Strap assembly
2. Web net assembly
3. Rope net assembly

Figure 4-32. Cargo Tiedown Installation (TS 013770)

Section X. MAINTENANCE OF SHELTER WATER SYSTEM

4-39. General

This section provides instructions for repair and replacement of those items considered as part of the shelter water system. Items of the water system repairable or replaceable at organizational level maintenance consist of a drain sump assembly, centrifugal sump pump assembly, check valve and miscellaneous fittings and clamps (fig. 4-24).

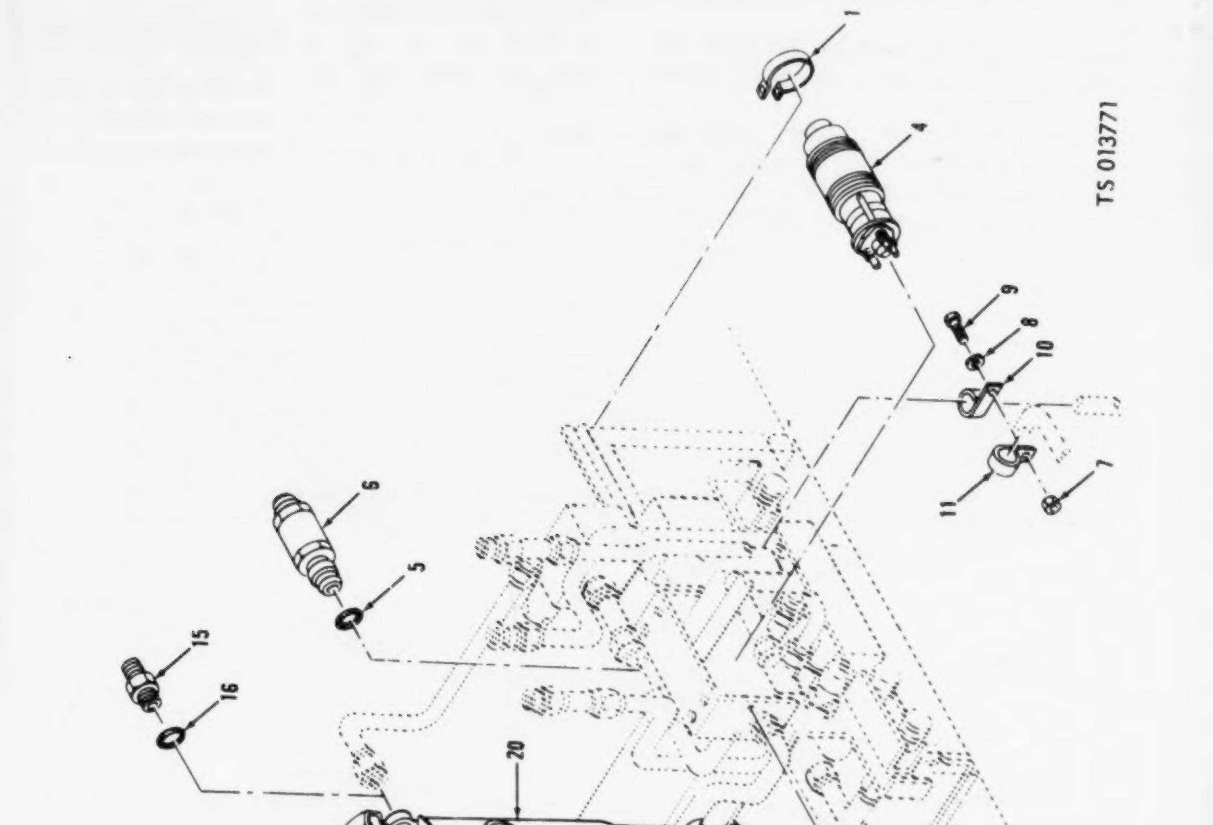

TS 013771
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Figure 4-24. Plumbing System Installation, Partial Disassembly (TS 013771)

1. Hose clamp
2. Nut (3)
3. Washer (3)
4. Centrifugal sump pump
5. Packing
6. Check valve
7. Nut
8. Washer
9. Bolt
10. Clamp
11. Clamp
12. Cap
13. Nut
14. Packing
15. Union
16. Packing
17. Bolt (3)
18. Washer (3)
19. Washer (3)
20. Drain sump
21. Bolt
22. Washer
23. Clamp (4)
24. Clamp (4)
25. Nut
26. Washer
27. Bolt
28. Clamp (6)
29. Bracket

Figure 4-24 — Continued.

4-40. Drain Sump Assembly

a. Removal

CAUTION

Turn off power to shelter before disconnecting electrical leads from float switch.

(1) Disconnect vent and drain inlet lines from side of drain sump (20, fig. 4-24). Disconnect outlet line from bottom of sump (16).

(2) Loosen nut (13) and remove tee from outlet drain boss; remove packing (14). Remove union (15) from vent boss on sump (20) and remove packing (16). If applicable, remove union from inlet boss and remove packing.

(3) Disconnect float switch electrical leads.

(4) Remove bolts (17) and washers (18, 19) from drain sump legs and remove sump (20).

b. Repair. Repair the shelter sump assembly as required to return to a serviceable condition as follows:

(1) Inspect drain sump assembly for damaged threads, nicks, dents, or burrs. If possible, dress all nicks and burrs with emery cloth assuring that enough wall thickness of sump remains to assure sufficient strength. Minor dents in the sump assembly are acceptable so long as the function or fit is not affected. Dress minor damage to threads with emery cloth and then test per paragraph 4-41 *c.* and assure that there are no leaks present. If methods lsited above cannot return the sump assembly to serviceable condition, replace the sump assembly.

(2) Remove clamp which secures cover assembly to sump and inspect filter screen for damage or dirt, replace damaged screen. Clean screen assembly by washing with clean water under slight pressure and hitting against a solid surface using care not to damage screen assembly.

c. Centrifugal Pump Test and Float Switch Test.

(1) Remove cover from drain sump (20, fig. 4-24) and fill with water.

(2) Close centrifugal sump circuit breaker located on electrical distribution panel assembly.

(3) Float switch inside the sump assembly shall energize the pump motor and discharge water from sump (20).

(4) Float switch shall shut off pump (4) when approximately two inches (5.08 cm) of water is remaining in sump (20). The remaining water will drain by gravity.

d. Installation. Using figure 4-24 as a guide, install the drain sump assembly as follows:

(1) Position the sump legs over the inserts in the floor and secure in place using bolts (17, fig. 4-24) and washers (18, 19).

(2) Install tee and new packing (14) in outlet boss. Tighten nut (13). Install union (15) and new packing (16) in vent boss.

(3) Connect float switch electrical leads.

(4) Connect and tighten plumbing line to sump.

4-41 Centrifugal Pump Assembly

a. Removal. Remove the centrifugal sump pump assembly (4, fig. 4-24) as follows:

(1) Remove the water service box cover.

(2) Disconnect inlet and outlet lines from pump (4) located inside water service inlet box.

(3) Disconnect electrical connector from end of pump (4).

(4) Remove nuts (2) and washers (3) securing the pump to the pump mounting bracket.

(5) Loosen and slide off clamp (1) securing pump (4) to pump mounting bracket.

(6) Remove pump (4) from water service inlet box.

b. Installation. Install centrifugal pump assembly (4, fig. 4-24) as follows:

CAUTION

Be sure electrical source is off before connecting electrical leads.

(1) Position pump (4) in proper position and secure with nuts (2) and washers (3).

(2) Slide clamp (1) over pump (4) and pump mounting bracket and tighten securely.

(3) Connect electrical connector to end of pump (4).

(4) Connect inlet and outlet lines to pump (4).

e. Centrifugal Pump Test and Float Switch Test.

(1) Remove cover from drain sump (20, fig. 4-24) and fill with water.

(2) Close centrifugal sump circuit breaker located on electrical distribution panel assembly.

(3) Float switch inside the sump assembly (20) shall energize the pump motor and discharge water from sump (20).

(4) Float switch shall shut off pump (4) when approximately two inches (5.08 cm) of water is remaining in sump (20). The remaining water will drain by gravity.

4-42. Check Valve

a. Removal. Remove the check valve (6, fig. 4-24) as follows:

(1) Disconnect inelt and outlet fittings from check valve (6) located directly behind centrifugal pump (4) in water service inlet box.

(2) Remove check valve (6) from water service box.

(3) Remove expander fitting from valve (6) and remove packing (5).

b. Installation. Using figure 4-24 as a guide, install the check valve as follows:

(1) Install new packing (5, fig. 4-24) on check valve (6) and install expander.

(2) Position check valve (6) with the arrow pointing down stream and tighten fittings on check valve (6).

4-43. Tube Assembly Clamps

a. Removal. Remove damaged or defective tube clamps according to sequence of index numbers assigned to figure 4-24 and observing the following:

(1) Remove nut, washer and bolts (7, 8, and 9, fig. 4-24). Spread clamps (10, 11) apart and slip from tube assemblies.

(2) Remove bolts (21), washer (22) and spread clamps (23, 24) apart and slip from tube assembly.

(3) Remove nut, washer and bolts (25, 26, 27). Remove bracket (29) and spread clamps (28) apart and slip from tube assemblies.

NOTE

Clamps (23, 24 and 28) are located inside the water tunnel and are reached by jacking up the shelter and removing the panels covering the water tunnel.

b. Installation. Using figure 4-24 as a guide, install clamps as follows:

(1) Install bracket (29, fig. 4-24) and close clamps (28) together and slip into tube assemblies. Install nut, washer and bolts (25, 26, 27).

(2) Install bolt (21), washer (22) and close clamps (23, 24) together and slip into tube assembly.

(3) Install nut, washer and bolts (7, 8, 9). Close clamps (10, 11) together and slip into tube assemblies.

Section XI. MAINTENANCE OF FABRIC PARTS

4-44. General

This section provides organizational maintenance personnel with general repair instructions applicable to the fabric parts of the expandable shelter.

4-45. Fabric Repair Procedures Using Adhesive

NOTE

Two fabric repair kits are furnished with each combat support hospital and evacuation hospital. The fabric repair kit is to be used in making fabric repairs to components of the expandable shelter.

a. Application of Adhesive. Apply adhesive for installation of patches to cover holes or other damage to fabric, to recement seams and to replace damaged cemented fabric as follows:

WARNING

Adhesive and solvents are highly flammable; perform work in well ventilated area and away from fire. Do not store adhesives or solvents in or near shelter.

(1) Clean the area to be cemented with a clean cloth dampened (but not saturated) with solvent to remove dust and foreign material. Do not allow excess solvent to collect at edges of seams. If the area is painted, remove all paint; adhesive will not adhere to painted surfaces. Dampen a clean cloth with solvent and rotate over the area until all paint is removed.

(2) Apply first coat of adhesive (from repair kit) to both surfaces to be cemented in medium to heavy coats. Brush back and forth to work adhesive in.

NOTE

Coated side of fabric (side with smooth slick surface) requires only one coat of adhesive. Uncoated side of fabric requires three coats of adhesive. The first coat of adhesive should be applied within 30 seconds after cleaning. If more than 30 seconds elapses, reclean surfaces. Thin adhesive with solvent as required to obtain smooth brushing consistency.

(3) Allow adhesive to dry to a tacky condition (approximately 15 min.) before applying next coat. Test for proper drying of adhesive by lightly pressing finger-knuckle against the adhesive surface. If there is a snap when the knuckle is pulling away from the adhesive, the surface is ready for another coat of adhesive.

NOTE

Drying time will differ under cold or extremely hot weather conditions. In direct sunlight at 70F. (21C.) or higher, the drying time required between coats of adhesive is approximately eight minutes.

(4) Apply a second even coat of adhesive to both surfaces. Allow second coat to dry to a tacky condition as determined in step (3), then apply a third even coat of adhesive.

(5) Activate the adhesive surfaces by wiping the surfaces with a clean cloth wet (not damp, not dripping) with solvent.

NOTE

This activates the adhesive and makes the surfaces ready for joining, this can be done up to eight hours after second coat of adhesive. Otherwise apply one more coat of adhesive.

(6) Press the adhesive surfaces together using rubber roller provided in repair kit. Be sure the fabric is backed up against a smooth, hard surface to provide pressure and ensure a good bond. After completion of cementing procedure, dust the cemented area with talc to cover up any exposed adhesive.

NOTE

Do not stress the cemented area for at least 4 hours after cementing.

b. Patching Holes. Apply patches to small holes in fabric as follows:

NOTE

Immediate repair of small pin or nail holes is not required. However, repair or small holes should be made as soon as it is convenient to do so.

(1) Cut a round patch from the bulk material provided in the repair kit. Use a one inch (2.5 cm) diameter patch for holes up to 1/16 inch (0.2 cm), a two inch (5.08 cm) patch for holes up to 1/4 inch (0.6 cm) and a 3½ inch (8.5 cm) patch for holes up to ½ inch (1.27 cm). For larger holes, cut a patch large enough to allow a three inch (7.6 cm) overlap beyond the edges of the hole.

(2) Clean both the area to be patched and the patch, then apply, and activate adhesive as described in paragraph *a.* above.

NOTE

Clean and apply adhesive to the proper side of the patch so that after installation the same color will be visible on the patch and the shelter.

(3) Join the adhesive surface of the patch to the adhesive surface of the shelter. Squeeze out all air bubbles between joined surfaces.

NOTE

The patch should be laid on gradually, one side on the other or from the center to the edges, to minimize the possibility of entrapped air. Use two men to apply ptaches larger than four inches, (10.16 cm) one to hold the top edges up and away from prepared surface while the other starts applying patch evenly and smoothly from the bottom. This will prevent the patch from wrinkling and forming air bubbles.

(4) Press the joined surfaces together using roller provided in repair kit.

NOTE

Pressure is important for a good bond. Be sure the fabric is backed up against a smooth hard surface.

(5) After pressing, dust the cemented areas with talc.

c. Patching Tears. Apply patches to the outside of a tear as follows:

(1) Trim off loose threads from the tear with shears provided in the repair kit.

(2) Cut a patch from bulk material provided in repair kit, large enough to allow a two inch (5.08 cm) overlap beyond torn edges.

(3) Clean the surface around the tear and clean the applicable side of the patch. Apply adhesive as described in *a.* above.

(4) Join the adhesive surface on the patch to the adhesive surface of the shelter. Squeeze all air bubbles from between the adhesive surfaces and use roller with pressure to bond the patch to the fabric. Dust the cemented area with talc.

d. Repairing Cemented Seams and Replacing Cemented Parts. Repair separated or damaged cemented seams and parts as follows:

(1) Carefully peel the cemented parts to separate, keeping the cloth soaked with solvent as

the parts are peeled apart. Examine the separated parts for damage and repair damage by patching or replacement, before recementing parts.

(2) Thoroughly clean surfaces to be cemented as described in paragraph *a.* above.

(3) Apply adhesive as described in paragraph *a.* above. Activate about 10 to 12 inches (25 to 30.5 cm) of the adhesive surfaces at a time as described in paragraph *a.* above. Allow the activating solvent to evaporate slightly (not wet) and press together about six to eight inches (15.24 to 20.32 cm) of the seam to ensure that no more seam will be joined at a time than has been activated.

(4) Join seams gradually. Press the surfaces together by moving the finger or thumb along the seam. Squeeze all air bubbles from between the adhesive surfaces.

(5) Roll each six to eight inch (15 to 20 cm) section immediately with the roller provided in the repair kit. When the seam in completely joined, reroll the length of the seam with roller.

e. Replacing Repair Patches (Patches Over Holes, Tears etc.) If a repair patch loosens at the edges, do not remove the complete patch for repair; cut off loose or fringed ends and cover the old patch with a new larger patch as follows:

NOTE

If old patch is off or is removed, install oversize patch to replace old patch.

(1) Repair a one inch (2.54 cm) patch with a three inch (8 cm) patch, a two (5.08 cm) inch patch with six inch (15 cm) patch and all larger patches with a patch extending three inches (8 cm) beyond the old area.

(2) Clean the area to be cemented and the applicable side of the patch as described in paragraph *a.* above.

(3) Apply adhesive and activate adhesive as described in paragraph *a.* above.

(4) Install new patch and use roller with pressure to bond patch.

Section XII. MAINTENANCE OF RIVETS AND INSERTS

4-46. General

This section provides organizational maintenance personnel with general repair and replacement instructions applicable to rivets and inserts used in the expandable shelter.

4-47. Blind Type Rivet Replacement

a. Storage and Handling. Rivets must be stored in the original labeled packages. The packages shall be kept closed when not in use to prevent dirt, grit, metal chips, etc, from coming in contact with the lubricated stems.

b. Removal. Rivets which are damaged or used for securing a replaceable part shall be removed as follows:

(1) Drill through the center of the rivet. Use a drill bit with the same diameter as the original rivet hole. The drill must be held perpendicular to the surface to prevent enlargement or damage to the existing hole. Drill through just deep enough to sever the rivet head from the shank.

(2) Remove any remaining rivet with a pin punch and remove any burrs from rivet hole.

c. Rivet Replacement. Select a rivet of the proper diameter and length and install as follows:

NOTE

Proper length of rivet to be used shall be determined by measuring the actual thickness of material through which the rivet will go and then selecting proper grip length per table 4-3. Proper rivet diameter is important as the blind rivets installed in oversize holes will not retain the stem satisfactorily. Undersize holes will not permit proper pull-in of stems (fig. 4-25).

(1) Hold parts to be riveted tightly together with clips, clamps or other satisfactory method.

(2) Insert proper rivet in hole and apply with gun (supplied with repair kit) by inserting stem head of rivet in bottom slot in gun pulling head (nose piece).

NOTE

Wet all rivets with sealant (EC 776, 3M Co., or equivalent) before installation.

(3) Hold gun at right angle to work. Push gun against work with just enough force to firmly seat rivet and to aid in avoiding sheet or other part separation.

(4) Pull rivet until stem breaks.

(5) Installed blind rivets shall be checked per paragrph *d.* below before proceeding.

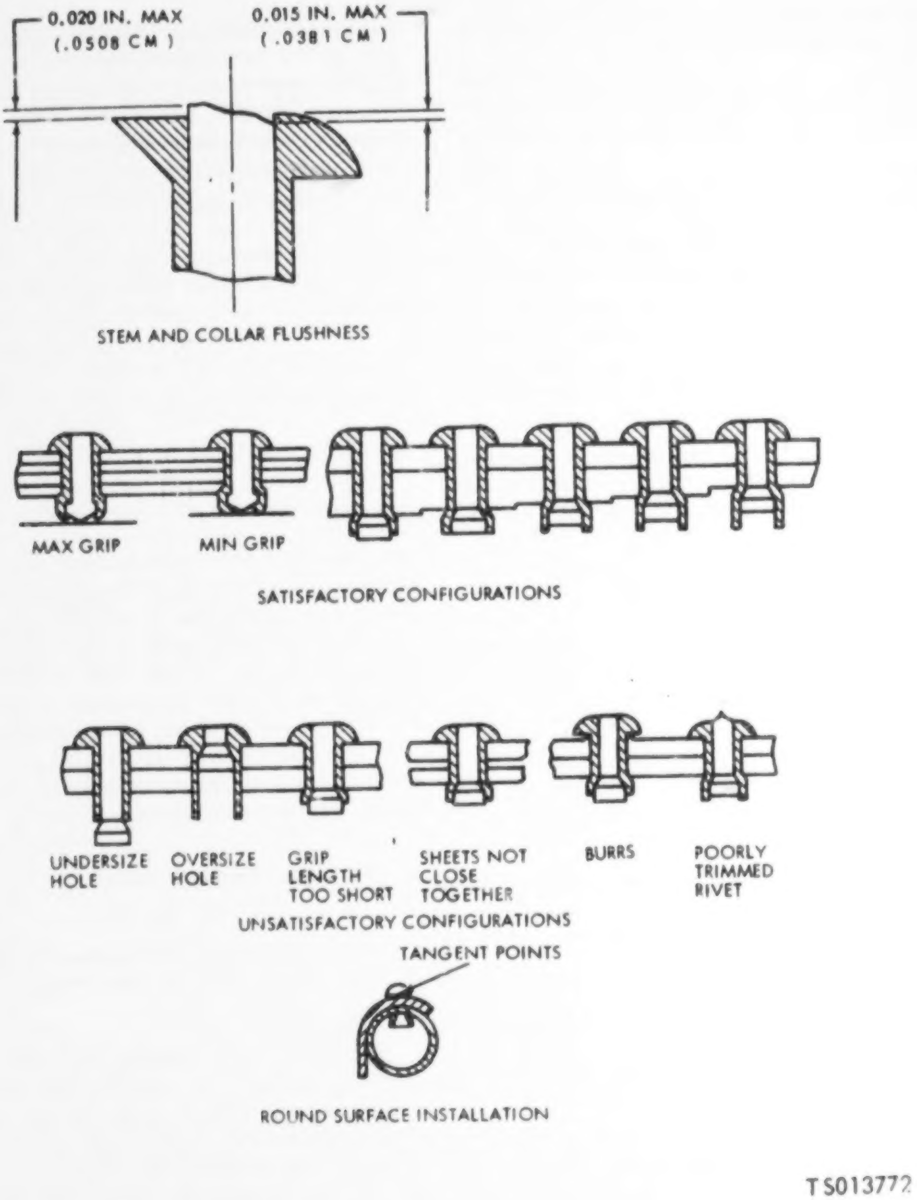

0.020 IN. MAX
(.0508 CM)
0.015 IN. MAX
(.0381 CM)
STEM AND COLLAR FLUSHNESS
MAX GRIP
MIN GRIP
SATISFACTORY CONFIGURATIONS
UNDERSIZE HOLE
OVERSIZE HOLE
GRIP LENGTH TOO SHORT
SHEETS NOT CLOSE TOGETHER
BURRS
POORLY TRIMMED RIVET
UNSATISFACTORY CONFIGURATIONS
TANGENT POINTS
ROUND SURFACE INSTALLATION
TS013772

Figure 4-25. Rivet Inspection (TS 013772)

(6) Trim the broken stem flush with the rivet head.

(7) Firmly press on the installed rivet to assure tightness.

d. *Inspection of Installed Rivets.* Installed rivets shall be inspected as follows:

(1) The rivet stem and collar shall be flush within the limits described in figure 4-25.

(2) The configurations of installed rivets with the blind side visible shall be similar to those shown in figure 4-25.

(3) Superficial stretch marks which may appear on the rivet are not detrimental to rivet strength and are acceptable.

(4) After stem trimming, stem can be checked for tightness by applying a force of approximately

Table 4-8. Blind Rivet Selection Chart

Nominal rivet diameter	Hole size and drill number	Diameter	Length	Grip range	Rivet number
3/32 (0.2381 cm)	0.096 - .100 (0.2438 - 0.254 cm cm)		.212 (0.5385 cm)	.020 - .125 (0.0508 - 0.3175 cm cm)	32
	#41	.094 (0.2388 cm)	.337 (0.8560 cm)	.126 - .250 (0.3200 - 0.635 cm cm)	34
			.170 cm)	.020 - .062 cm cm)	41
			.232 (0.5893 cm)	063 - .125 (0.1600 - 0.3175 cm cm)	42
			.294 (0.7468 cm)	.126 - .187 (0.3200 - 0.4750 cm cm)	43
1/8 (0.3175 cm)	.128 - .132 (0.3251 - 0.3353 cm cm)		.357 (0.9068 cm)	.188 - .250 (0.4775 - 0.635 cm cm)	44
	#30	.125 (0.3175 cm)	.419 (1.0643 cm)	.251 - .312 (0.6375 - 0.7925 cm cm)	45
			.481 (1.2217 cm)	.313 - .375 (0.7950 - 0.9525 cm cm)	46
			.628 (1.5951 cm)	.376 - .500 (0.9550 - 1.27 cm cm)	48
			.254 (0.6452 cm)	.020 - .125 (0.0508 - 0.3175 cm cm)	52
	.160 - .164 (0.4064 - 0.4166 cm cm)		.316 (0.8026 cm)	.126 - .187 (0.3200 - 0.4750 cm cm)	
5/32 (0.3969 cm)	#20	.156 (0.3962 cm)	.379 (0.9627 cm)	.188 - .250 (0.4775 - 0.635 cm cm	54
			.504 (1.2802 cm)	.251 - .375 (0.6375 - 0.9525 cm cm)	56
			.629 (1.5977 cm)	.376 - .500 (0.9550 - 1.27 cm cm)	
			.277 (0.7036 cm)	.020 - .125 (0.0508 - 0.3175 cm cm)	62
	.192 - .196 (0.4877 - 0.4978 cm cm)		.402 (1.0211 cm)	.126 - .250 (0.3200 - 0.635 cm cm)	64
3/16 (0.4762 cm)	#11	.187 (0.4750 cm)	.527 (1.3386 cm)	.251 - .375 (0.6375 - 0.9525 cm cm)	66
			.652 (1.6561 cm)	.376 - .500 (0.9550 - 1.27 cm cm)	68
			.777 (1.9736 cm)	.501 - .625 (1.2725 - 1.5875 cm cm)	610
			.902 (2.2911 cm)	.626 - .750 (1.59 - 1.905 cm cm)	
	.257 - .261 (0.6528 - 0.6629 cm cm)		.447 (1.1354 cm)	.125 - .250 (0.3175 - 0.635 cm cm)	84
1/4 (0.635 cm)	F	.250 (0.635 cm)	.572 (1.4529 cm)	.251 - .375 (0.6375 - 0.9525 cm cm)	86
			.697 (1.7704 cm)	.376 - .500 (0.9550 - 1.27 cm cm)	88
			.947 (2.4054 cm)	.626 - .750 (1.59 - 1.905 cm cm)	812

ten pounds to the trimmed stem of the rivet, push steadily; do not strike. If the stem is neither pushed out or loose, tightness is satisfactory.

(5) Rivet head gapping shall be checked with a 0.002 feeler gage. Rivets with a 0.002 (0.0051 cm) gap on more than 40 percent of the rivet head circumference shall not be acceptable.

(6) A partial gap on a round surface is acceptable, provided the rivet head bears at tangent points as shown in figure 4-25.

4-48. Insert Replacement

NOTE

Size of the hole drilled and capscrew or bolt size will vary for the particular insert being removed.

a. Removal.

(1) Some loose inserts may be removed by screwing a capscrew into the opening and pulling the insert out with a piers; if this method fails, proceed as follows: Drill a hole about 3 inches (7.6 cm) from the end of a 1" (2.54 cm) x 1/4" (0.635 cm) x 12" (30.48 cm) steel bar. Place the hole of the bar over the insert and thread a capscrew through the bar end into the insert. The capscrew should be long enough to "bottom" in the insert and leave clearance between the head of the screw and the bar. Turn the capscrew with a pneumatic wrench and pry outward with the metal bar until the insert is pulled out.

(2) Remove loose particles from the hole using a compressed air blast with clean air.

b. Potting Resin (adhesive) Mixing. The adhesive compound shall be blended using a 50 percent resin and 50 percent curing agent ratio. Blend the resin and the curing agent together in a paper mixing cup using long, smooth strokes, rather than a whipping motion. Pot life at normal ambient temperature (75°F. (24°C.) +5°F. (-15°C.) is approximately 2 hours. Length of time decreases with increased temperature. Discard time should be at a point where the epoxy is no longer pliable enough to be worked into the cavity.

c. Application of Potting Compound. Apply the adhesive compound observing the following:

(1) Use a clean tongue depressor to trowel the adhesive compound into the insert hole.

(2) Care shall be exercised during the trowelling operation to prevent entrapment of air pockets in the insert hole.

(3) Use enough adhesive to ensure complete filling of the hole after application of the insert.

d. Installation of Inserts. Use the same size and type of insert as the one removed, observing the following:

(1) Turn screws and washers completely and tightly into insert making sure that the washer is seated firmly on the upper flange of the insert. Firm seating of the washer on the upper flange is required to insure proper positioning of the insert during the setup period.

(2) Clean outside of insert with a lint free cloth soaked with methyl-ethyl-ketone. Allow insert to dry.

(3) Place insert in hole and press down firmly.

(4) Wipe hole area with lint free cloth soaked with methyl-ethyl-ketone, to remove adhesive residue left on the surface.

(5) Cover the hole area with tape making sure that the washer is held down firmly by the tape. A diagram of a typical installation of an insert in a honeycomb panel is given in figure 4-26.

(6) Non-structural inserts should be allowed to cure for at least 4 hours prior to handling or usage. Inserts on which there is structural dependency should not be distributed for 72 hours. Epoxy manufacturer's specification sheets list the following cure time to attain maximum strength:

@77F. (25C.) – 72-120 hours
@150F. (66C.) — 3-4 hours
@200F. (93C.) — 40-60 minutes

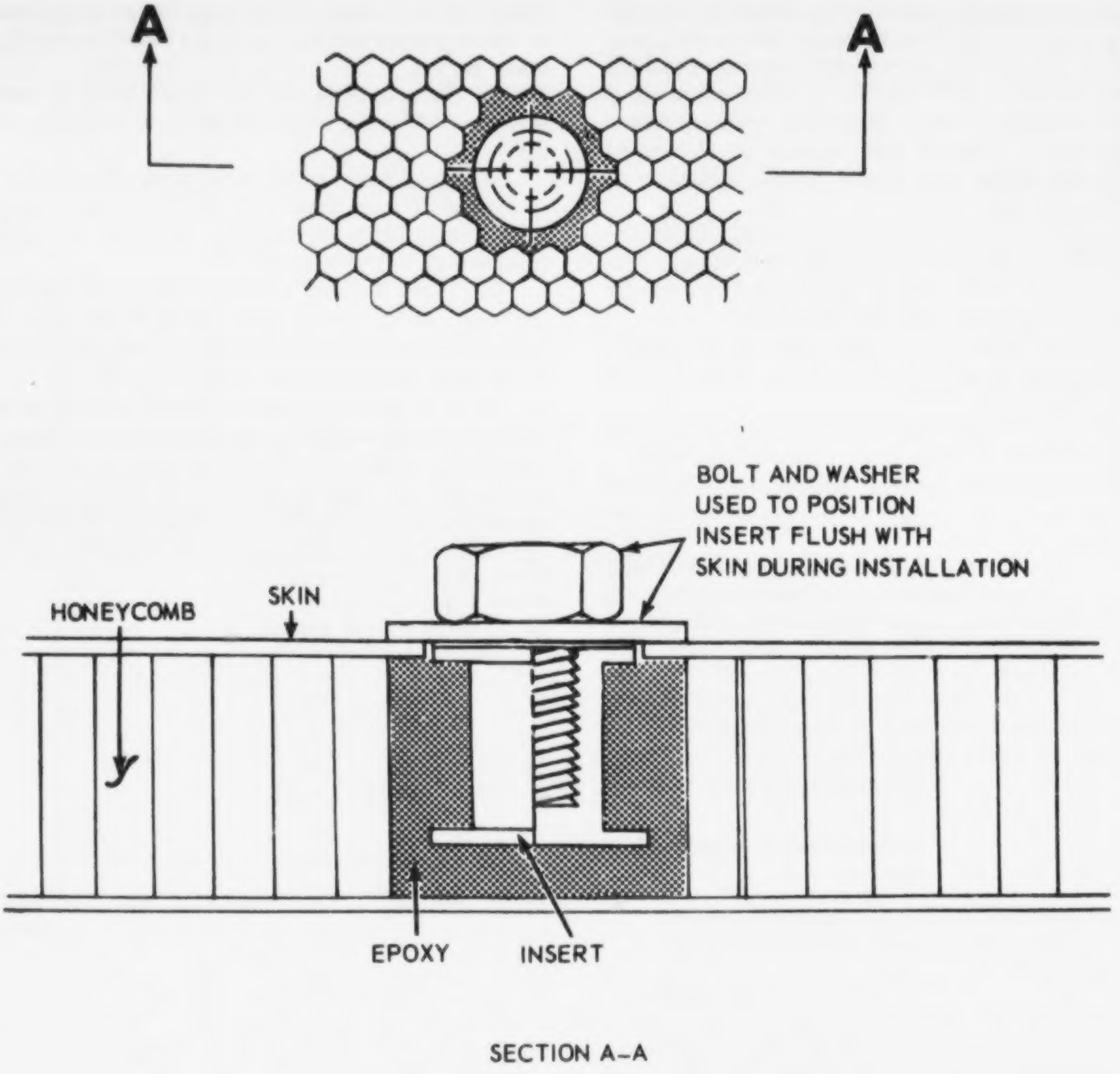

A
A
BOLT AND WASHER USED TO POSITION INSERT FLUSH WITH SKIN DURING INSTALLATION
HONEYCOMB
SKIN
EPOXY
INSERT
SECTION A–A
TS013773

Figure 4-26. Typical Insert Installation (TS 013773)

Section XIII. MAINTENANCE OF HONEYCOMB PANEL

4-49. General

This section provides organizational maintenance personnel with general repair instructions applicable to the honeycomb parts of the expandable shelter.

4-50. Repair Procedures Using Plug Patche and Adhesive

a. Mixing of Two Part Adhesive. Mixing of adhesive, used for repair of honeycomb core, shall be accomplished as follows:

(1) Use a mixing ratio of from 50 parts accelerator to 50 parts based by volume, to 100 parts accelerator to 100 parts base by volume.

WARNING

Adhesives and solvents are highly flammable; perform work in well ventilated area and away from fire.

(2) Add the proper amount of adhesive base and accelerator to a mixing cup (from repair kit) and mix thoroughly using a mixing paddle from the repair kit. The pot life of the adhesive after mixing is 45 minutes.

b. *Repairing Honeycomb Panel with Damage to One Surface Only.* Repair damaged honeycomb panel as follows:

(1) Trim the damaged area of the aluminum facing using tin snips, circular saw or other suitable tool (fig. 4-27).

(2) Trim honeycomb core with a knife to the same size as the trimmed hole in the facing through the entire thickness of the core (fig. 4-27).

NOTE

In general, trimmed holes are not restricted as to size, or shape; however, those of rectangular, circular, square and oval and rectangular with round ends usually are more desirable as to appearance and ease of installation.

(3) Clean the interior surface of the undamaged facing with emery cloth, and a clean lint free cloth soaked with methyl-ethyl-ketone.

(4) Cut a section of honeycomb core material the same size as the trimmed hole using the honeycomb furnished with the repair kit.

(5) Fabricate plug patch plate which will overlap hold opening by approximately three inches (8 cm) on all sides using figure 4-27 as a guide.

(6) Drill rivet holes in the patch plate using a number 30 drill (0.128-0.132 inch (0.3251cm-0.3353cm) diameter) and spaced as illustrated in figure 4-27.

(7) Drill matching holes in panel using the patch plate as a template.

(8) Apply a thin coat of adhesive to the cleaned interior facing (step 3, above), the edges of the honeycomb core.

(9) Insert the honeycomb core into the trimmed area of the panel and press firmly in place. Fill area above core with adhesive and place plug patch in position.

(10) Secure the patch plate in position using 1/8 inch (0.3175cm) domed head blind rivets (from repair kit).

(11) Repaint repaired area following procedures listed below.

(a) Surface preparation. Metal to metal, wood to metal and wood to wood contact surfaces, except those to be welded or hot riveted or where paint will interfere with the fit or function of a part in assembly, shall have the specified treatment and primer (table 4-4) applied before assembly. Surfaces welded or hot riveted shall be cleaned and painted with the specified coating system.

(b) Exterior surfaces. Exterior surfaces and components shall be primed with one coat Epoxy Primer, or equivalent (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Apply two finish coats of Specification TT-E-527 enamel (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Color match per Federal Standard 595 No. 34087.

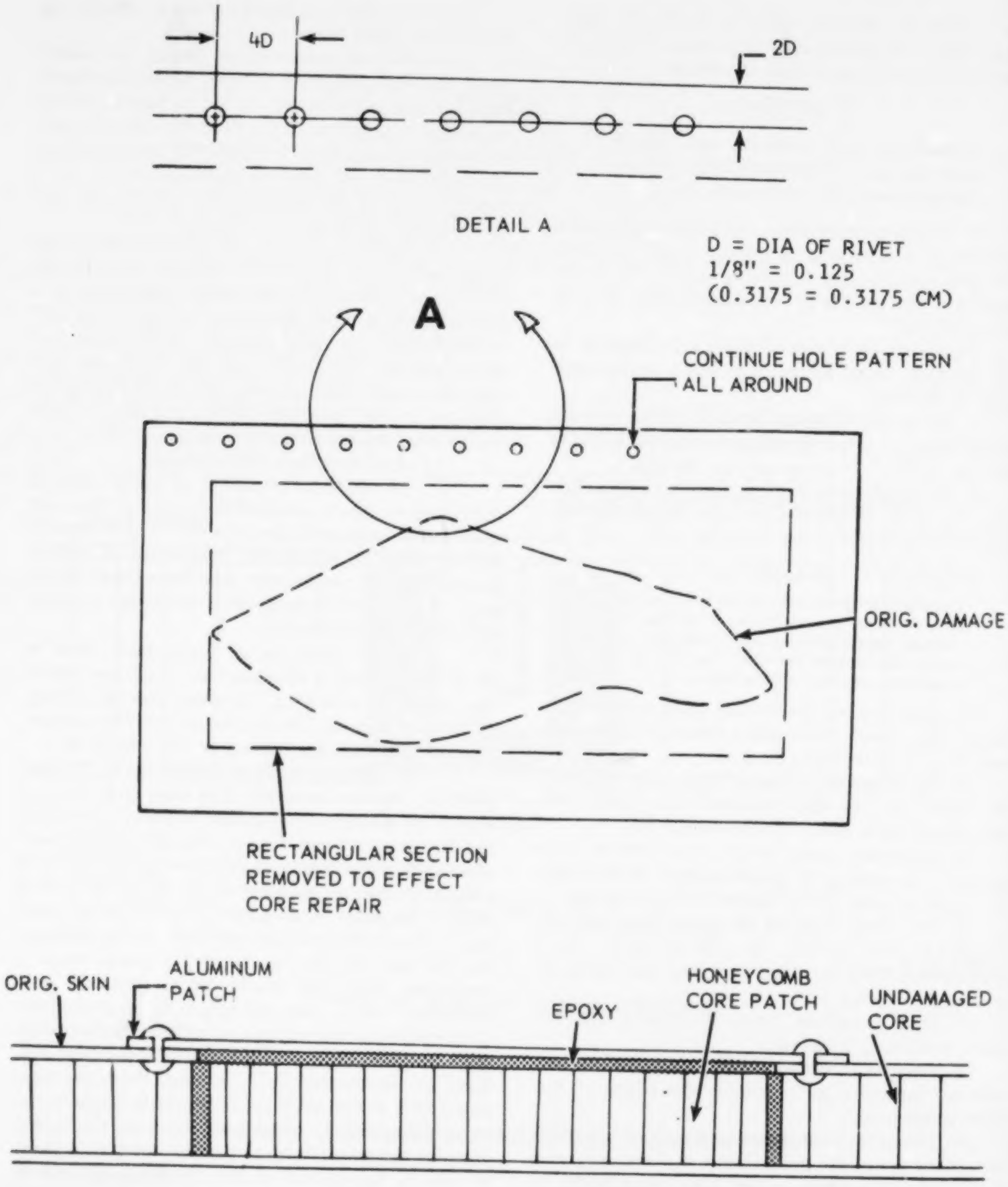
(c) Quality control requirements.

1. A sufficient number of parts shall be examined to assure acceptable quality of finishing on all parts. In general, the criteria listed in steps (2) and (3) shall be evaluated. Properties or performance characteristics other than those shown below may be required by applicable drawings or other authoritative documents.

2. The finish in all types shall show no visual indication of alligatoring, blistering, chalking, checking, cracking, crawling, flaking, lifting, peeling, or sealing. The finish shall exhibit no sags, runs, skips, shading, dusting or dry overspray.

3. Adhesion shall be conducted on finished parts at regular intervals. The tests shall be conducted on a sufficient number of parts selected at random to assure manitenance of a satisfactory level of adhesion on all parts. In performing this test, it is suggested that a plastic or wood stylus be used to scratch the paint films. A metal stylus may be used, but extreme care must be exercised to avoid damaging the basic surface of the part. Several parallel scratches shall be made approximately one-sixteenth inch (0.1588 cm) apart. Apply a one inch (2.54 cm) wide strip of tape, adhesive side down over the scratches. Only newly manufactured tape less than six months old shall be used. Press the tape down with a firm pressure of the hand. Remove the tape in one abrupt action and examine the tested area for any paint damage such as removal of paint at one of the layers of the finishing system or removal of the entire system from the surface. Test panels may be used.

4. Touch-up after test. Areas which have been used for testing shall be refinished to equal as


4D
2D
DETAIL A
D = DIA OF RIVET
1/8" = 0.125
(0.3175 = 0.3175 CM)
A
CONTINUE HOLE PATTERN ALL AROUND
ORIG. DAMAGE
RECTANGULAR SECTION REMOVED TO EFFECT CORE REPAIR
ORIG. SKIN
ALUMINUM PATCH
EPOXY
HONEYCOMB CORE PATCH
UNDAMAGED CORE

TS013774

Figure 4-27. Typical Honeycomb Panel Repair (TS 013774)

Table 4-4. Finishing Systems

Type	Surface	Pretreatment	Primer	Coats	Intermediate	Coats	Finish	Coats
A	Metal	MIL-P-153287/	TT-E-485 2/5/6/8/	1	-	-	TT-E-485 1/2/3/4/5	1
	Wood	MIL-S-13518 Type I	TT-P-636 6/	1	-	-	TT-E-529 3/4/	1
B	Metal	MIL-P-153287/ Type I	MIL-P-12742	1	MIL-P-12742	1	TT-E-522	1
C	Metal	MIL-P-153287/	-		-	-	TT-E-4855/	1
D	Metal	MIL-P-153287/	MIL-P-85859/1		-	-	TT-E-529	2
E	Metal	MIL-P-513287/	MIL-P-85895/1		-	-	MIL-L-52043	2

near as possible the original finish requirement. The color of touched up areas shall be reasonably close to that of the surrounding area.

c. Repair to Honeycomb Panel with Damage to Both Surfaces. Damage to panel which penetrates both surfaces shall be repaired using procedure given in paragraph *b.* above. Both facings shall be repaired.

d. Repair to Fabric Floor Covering. Repair damaged or worn floor fabric as follows:

(1) With a sharp knife cut a square area from around damaged or worn section.

NOTE

If aluminum facing or honeycomb core is damaged, repair using procedures given in paragraph *b.*, steps (1) through (5), (9) and (10). Do not install doubler plate in order to assure a smooth surface.

(2) Peel away damaged flooring. Use the removed flooring as a template and cut a new section using the flooring fabric supplied in the repair kit.

(3) Thoroughly clean the repair area with emery cloth and a clean, lint-free cloth soaked in methyl-ethyl-ketone.

(4) Apply a thin coat of the one part adhesive, supplied with the repair kit, to the floor surface and also to the floor fabric.

(5) Press the patch over the trimmed damaged area and work out any trapped air bubbles.

NOTE

The patch should be laid on gradually, one side on the other, or from the center to the edges, to minimize the possibility of entrapped air. Use two men to apply patches larger than four inches, (10.16 cm) one to hold the top edges up and away from prepared surface while the other starts applying patch evenly and smoothly from the bottom. This will prevent the patch from wrinkling and forming air bubbles.

(6) Cover the seams of the repaired area with mylar tape (supplied with repair kit).

e. Repair to Damaged Honeycomb Panel Edging (Closeouts). Repair damaged panel edging as follows:

(1) Remove the damaged phenolic edging with a sharp knife to cut away from honeycomb core, using care to prevent damage to honeycomb core and aluminum facing edge.

(2) Cut a section of phenolic edging the same size as the damaged area and apply a thin coat of the two parts adhesive to the phenolic edging back.

(3) Press the edging firmly in place and allow to cure for a minimum of 8 hours.

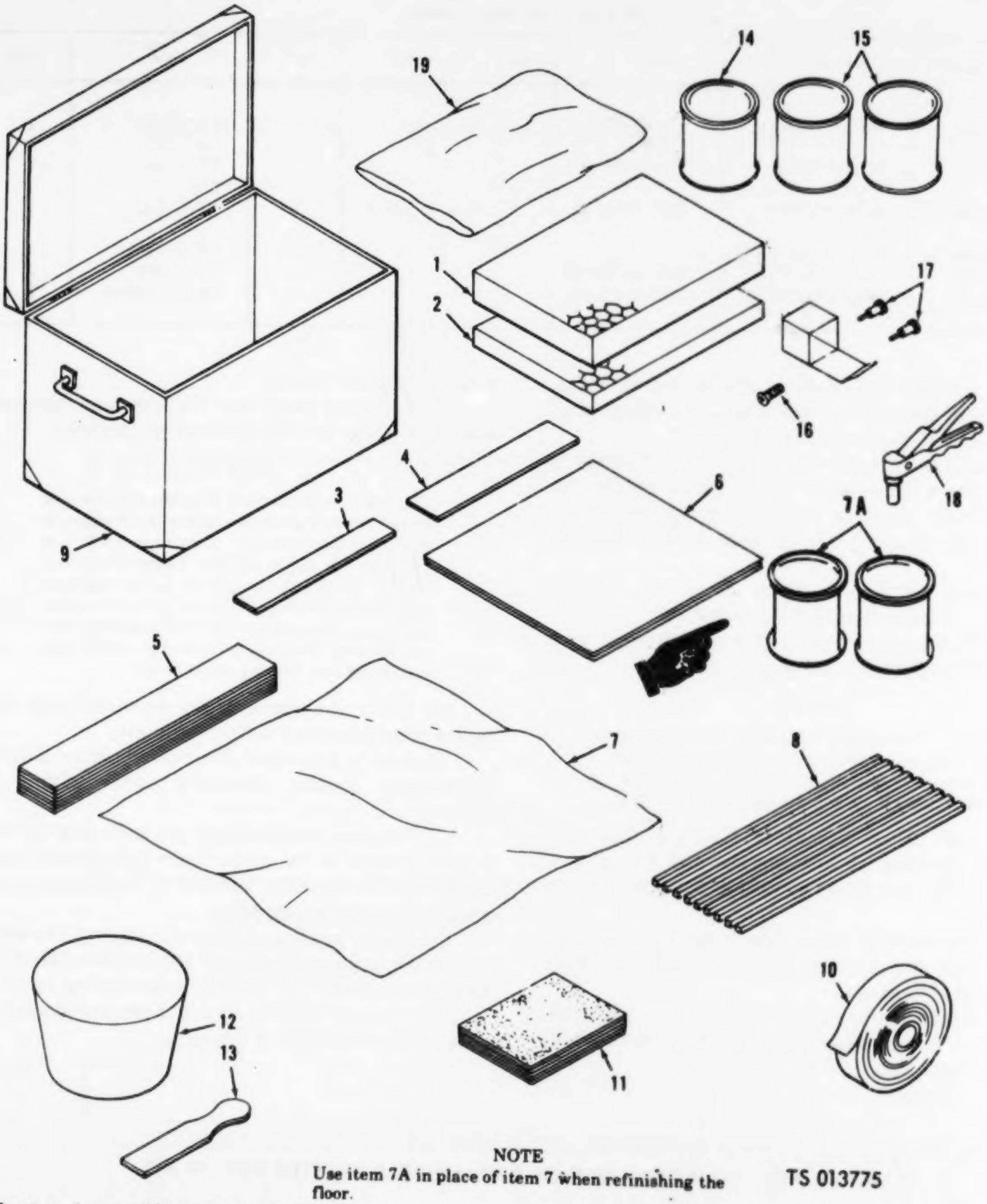
Section XIV. MAINTENANCE OF EXPANDABLE SHELTER REPAIR KIT

4-51. General

This section provides instructions for replacement of those items considered as part of the expandable shelter repair kit. The components of the repair kit are stowed in a plywood box assembly 24 inch x 16 inch x 16.5 inch (60.96 cm x 40.64 cm x 41.91 cm) and are listed in the Tabulated Data, paragraph 1-6.

4-52. Replacement of Components of Repair Kit

Components of the repair kit should be replaced as soon as possible after use in order to maintain a complete kit at all times. See tabulated data, paragraph 1-6 and figure 4-28 for identification of components of the repair kit.



NOTE

Use item 7A in place of item 7 when refinishing the floor.

TS 013775

1. Honeycomb core (2.90 inches (7.366 cm) thick, 1)
2. Honeycomb core (1.92 inches (4.8768 cm) thick, 1)
3. Phenolic (12 in. x 2.00 in. x 0.12 in., 2) (30 cm x 5 cm x .30 cm, 2)
4. Phenolic (12 in. x 3.00 in. x 0.12 in., 2) (30 cm x 7.5 x .30, 2)
5. Facing, aluminum (3.0 in. x 18.0 in. x 0.050 in., 8) (7.5 cm x 45 cm x 13 8)
6. Facing, aluminum (15.0 in. x 15.0 in. x 0.050 in., 3) (37.5 cm x 37.5 cm x 13 cm 3)
7. Velstat flooring (2 ft) (1858 sq)

7A. Floor refinishing primer and rubber coating

8. Seal assemblies (6 ft long, 9)
9. Box assembly (1)
10. Mylar tape (1 roll)
11. Emery cloth (6)
12. Mixing cup (12)
13. Mixing paddle
14. Adhesive (1 pint) (.47 liters)
15. Adhesive, two part (1 quart each) (.95 liters each)
16. Screw (MS21207-8-6, 200)
17. Rivet (AK42H, AD42H, 200)
18. Hand riveter and nose piece (1 each)
19. Cotton bag (1)

Figure 4-28. Repair Kit (TS 013775)

CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS SPECIAL TOOLS AND EQUIPMENT

5-1. Tools and Equipment

No specially designed tools or equipment are required by direct and general support maintenance personnel for maintenance of the expandable shelter.

5-2. Special Tools and Equipment

There are no special tools or equipment required by direct and general support maintenance personnel for maintenance of the expandable shelter.

5-3. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in the repair parts and special tools list. Refer to TM 10-5410-221-24P/1.

Section II. TROUBLESHOOTING

5-4. General

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may devleop in the expandable shelter. Each malfunction or trouble symptom for an individual component, unit or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and causes are obvious), or is not corrected by listed corrective actions, you should notify higher level maintenance.

5-5. Direct Support and General Support Maintenance Troubleshooting

Table 5-1 lists the common malfunctions that you may find during the operation or maintenance of the expandable shelter or its components. You should perform the tests/inspections and corrective actions in the order listed.

Table 5-1. Troubleshooting

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

1. CIRCUIT BREAKER TRIPPED

Step 1. Check for electrical overload and shorts in circuit by testing the electrical system using a multimeter or other checking device (para 11-2).

Correct shorts then reset the circuit breaker by pushing the reset button on the control panel. If circuit breaker will not stay set correctly, replace the circuit breaker as follows:

a. Removal.
(1) Tag and disconnect all electrical leads.
(2) Remove all mounting hardware.
(3) Remove the defective circuit breaker.
b. Installation.
(1) Replace the circuit breaker to its original position., (2) Install all mounting hardware.
(3) Correct all electrical leads and remove tags.

Step 2. Check for a malfunction (out of set position) circuit breaker (fig. 5-1).

Table 5-1. Troubleshooting—Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Reset the circuit breaker by pushing the reset button on the control panel. If circuit breaker will not stay set correctly, replace the circuit breakers as follows:

a. *Removal.*
(1) Tag and disconnect all electrical leads.
(2) Remove all mounting hardware.
(3) Remove the defective circuit breaker.

b. *Installation.*
(1) Replace the circuit breaker to its original position.
(2) Install all moutning hardware.
(3) Correct all electrical leads and remove tags.

2. NO ELECTRICAL POWER INSIDE SHELTER

Check for trapped circuit breakers.

Reset the circuit breaker by pushing the reset button on the control panel. If circuit breaker will not stay set correctly, replace the circuit breaker as follows:

a. *Removal.*
(1) Tag and disconnect all electrical leads.
(2) Remove all mounting hardware.
(3) Remove the circuit breaker.

b. *Installation.*
(1) Replace the circuit breaker to its original position.
(2) Install all mounting hardware.
(3) Connect all electrical leads and remove tags.

3. NO HOT OR COLD WATER INSIDE

Check for a defective dual water hose heater receptacle (shelters used in areas having ambient temperatures below 38°F (3°C) only). Check for a tripped water tunnel heater circuit breaker.

Reset circuit breaker. If the circuit breaker will not stay set correctly, then replace the defective circuit breaker as follows:

a. *Removal.*
(1) Tag and disconnect all electrical leads.
(2) Remove all mounting hardware.
(3) Remove the defective circuit breaker.

b. *Installation.*
(1) Replace the circuit breaker to its original position.
(2) Install the mounting hardware.
(3) Connect all electrical leads and remove tags.

4. WASTE WATER WILL NOT DRAIN OR DRAINS SLOWLY

Step 1. Inspect for a tripped sump pump circuit breaker.

Reset the circuit breaker. If the circuit breaker will not stay set correctly, then replace the defective circuit breaker as follows:

a. *Removal.*
(1) Tag and disconnect all electrical leads.
(2) Remove all mounting hardware.
(3) Remove the defective circuit breaker.

b. *Installation.*
(1) Replace the circuit breaker to its original position.
(2) Install all mounting hardware.
(3) Connect all electrical leads and remove tags.

Step 2. Check for water tunnel heater or drain hose heater receptacle circuit breakers tripped (shelters used in areas having ambient temperatures below 38F. (3°C.) only).

Reset circuit breaker. If the circuit breaker will not stay set correctly, then replace the defective circuit breaker as follows:

a. *Removal.*
(1) Tag and disconnect all electrical leads.
(2) Remove all mounting hardware.
(3) Remove the defective circuit breaker.

Table 5-1. Troubleshooting—Continued

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

b. Installation.

(1) Replace the circuit breaker to its original position.

(2) Install all mounting hardware.

(3) Connect all electrical leads and remove tags.

Step 3. Check for defective (worn or deteriorated) drain hose heater.

Replace drain hose as follows:

a. Detach from the drain quick disconnect type connector at the water service inlet or outlet boxes (fig. 2-1).

b. Detach the drain hose heater receptacle, if used, from the receptacle at the water service inlet or outlet water boxes.

Section III. GENERAL MAINTENANCE

5-6. General

This section provides direct and general support maintenance personnel with general repair instructions applicable to the fabric parts of the expandable shelter.

5-7. Repair Procedures For Sewn Fabric Parts

CAUTION

Use extreme care in cutting stitches to prevent cutting or other damage to fabric. If fabric is cut or otherwise damaged, apply patch to damaged area.

a. Removal of Sewn Fabric Parts. Remove sewn fabric parts by carefully cutting stiches securing parts with a seam ripper or other sharpened tool. Remove cut stitches from fabric parts.

b. Installation of Sewn Fabric Parts. Position parts to be sewn together and temporarily secure the position of parts. Sew parts together with five to nine stitches per inch (2.54 cm). Use single needle or double needle stitching as noted on removed part. Figure 5-2 illustrates sewing repair procedure on air lock chamber components. This type of stitch shall be formed with two threads: one needle thread, A, and one bobbin thread, B. A loop of thread A shall be passed through the material and interlaced with thread B. Thread A shall be pulled back so that the interlacing shall be midway between surfaces of the material or materials being sewn.

5-8. Repair Procedures For Slide Fasteners

a. Refer to TM 9-2865, Repair of Slide Fasteners, and instructions listed in *b.* and *c.* below to replace slide fasteners.

NOTE

Use extreme care in cutting stitches to prevent cutting or other damage to fabric.

b. Remove stitching and take off old slide fastener. Replace with No. 10 2/8 inch (0.635 cm) long slide fsatener listed in repair parts manual.

c. To stitch a new slide fastener place cover on edge and run through a drop-table sewing machine.

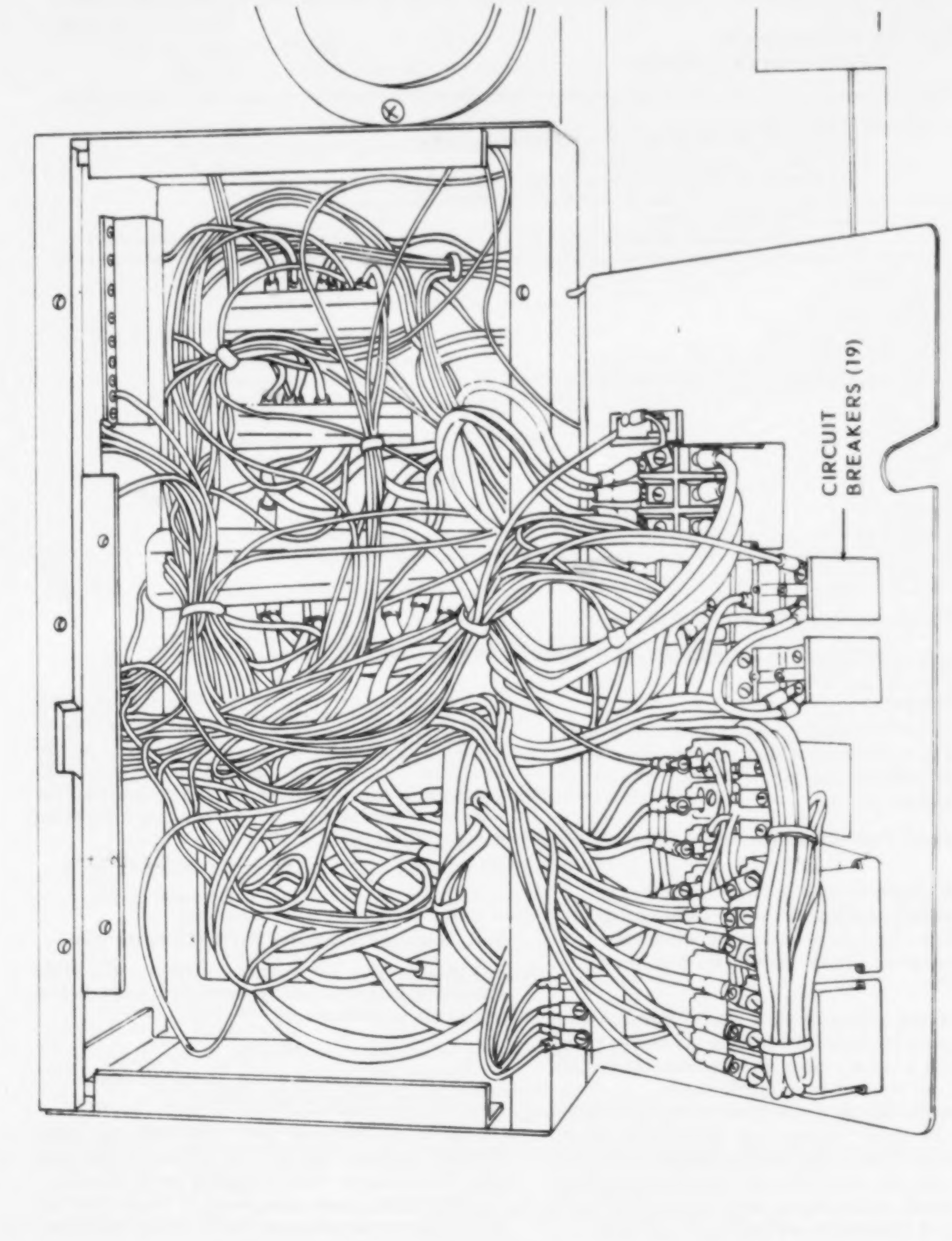
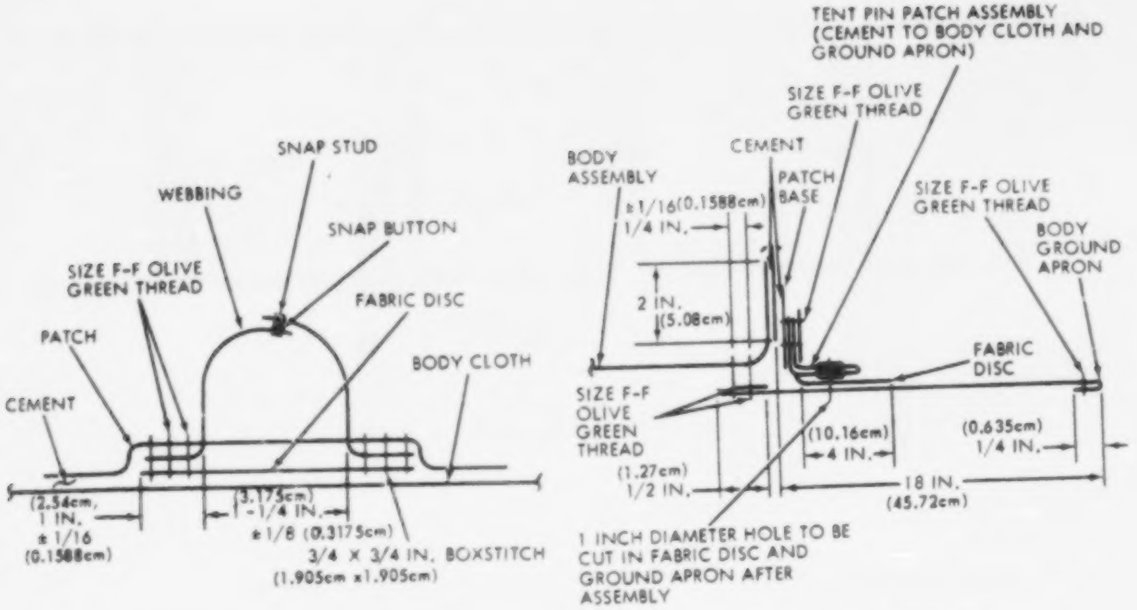
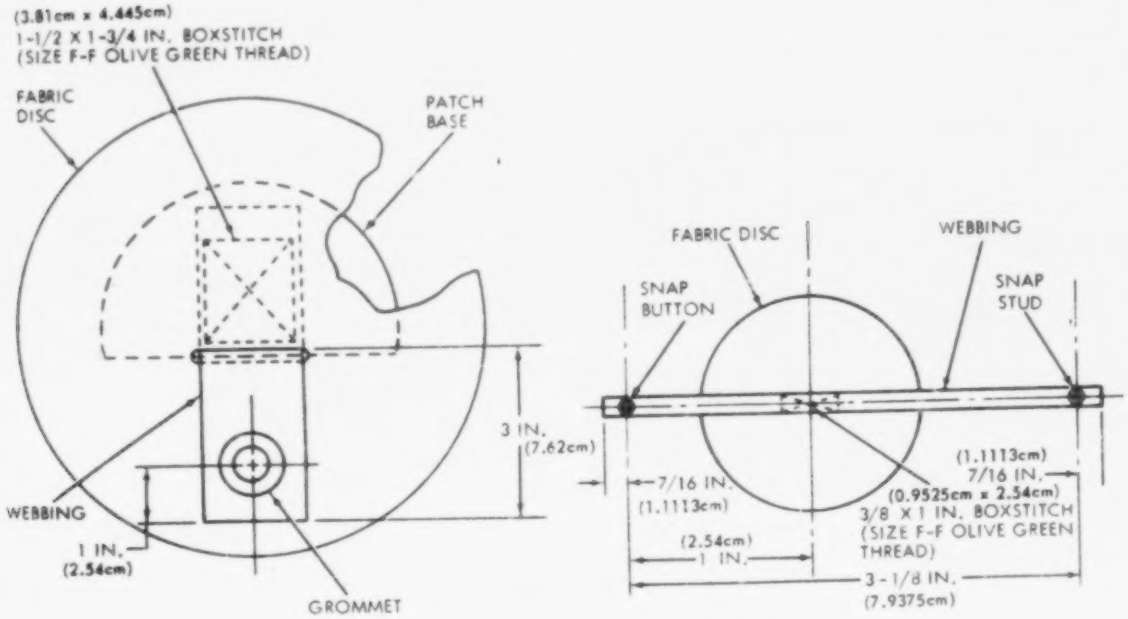

CIRCUIT BREAKERS (19)
TS013776

Figure 5-1. Circuit Breaker Assembly (TS 013776)


SNAP STUD
WEBBING
SNAP BUTTON
SIZE F-F OLIVE GREEN THREAD
FABRIC DISC
PATCH
BODY CLOTH
CEMENT
(2.54cm, 1 IN. ± 1/16 (0.1588cm)
(3.175cm) 1-1/4 IN.
± 1/8 (0.3175cm)
3/4 X 3/4 IN. BOXSTITCH (1.905cm x 1.905cm)
TENT PIN PATCH ASSEMBLY (CEMENT TO BODY CLOTH AND GROUND APRON)
SIZE F-F OLIVE GREEN THREAD
CEMENT
BODY ASSEMBLY
PATCH BASE
± 1/16 (0.1588cm)
1/4 IN.
SIZE F-F OLIVE GREEN THREAD
BODY GROUND APRON
2 IN. (5.08cm)
FABRIC DISC
SIZE F-F OLIVE GREEN THREAD
(10.16cm) 4 IN.
(0.635cm) 1/4 IN.
(1.27cm) 1/2 IN.
18 IN. (45.72cm)
1 INCH DIAMETER HOLE TO BE CUT IN FABRIC DISC AND GROUND APRON AFTER ASSEMBLY

A. BOW HOLDING SNAP ASSEMBLY

B. TENT PIN PATCH ASSEMBLY

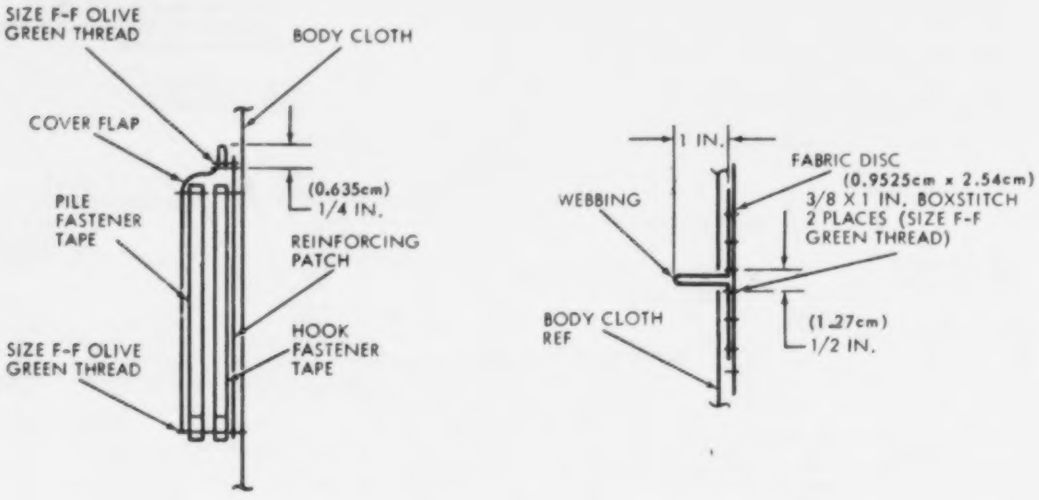

(3.81cm x 4.445cm) 1-1/2 X 1-3/4 IN. BOXSTITCH (SIZE F-F OLIVE GREEN THREAD)
FABRIC DISC
PATCH BASE
3 IN. (7.62cm)
WEBBING
1 IN. (2.54cm)
GROMMET
FABRIC DISC
WEBBING
SNAP BUTTON
SNAP STUD
7/16 IN. (1.1113cm)
(1.1113cm) 7/16 IN.
(0.9525cm x 2.54cm) 3/8 X 1 IN. BOXSTITCH (SIZE F-F OLIVE GREEN THREAD)
(2.54cm) 1 IN.
3-1/8 IN. (7.9375cm)

C. TENT PIN PATCH ASSEMBLY INSTALLATION

D. LIGHT FIXTURE PATCH ASSEMBLY

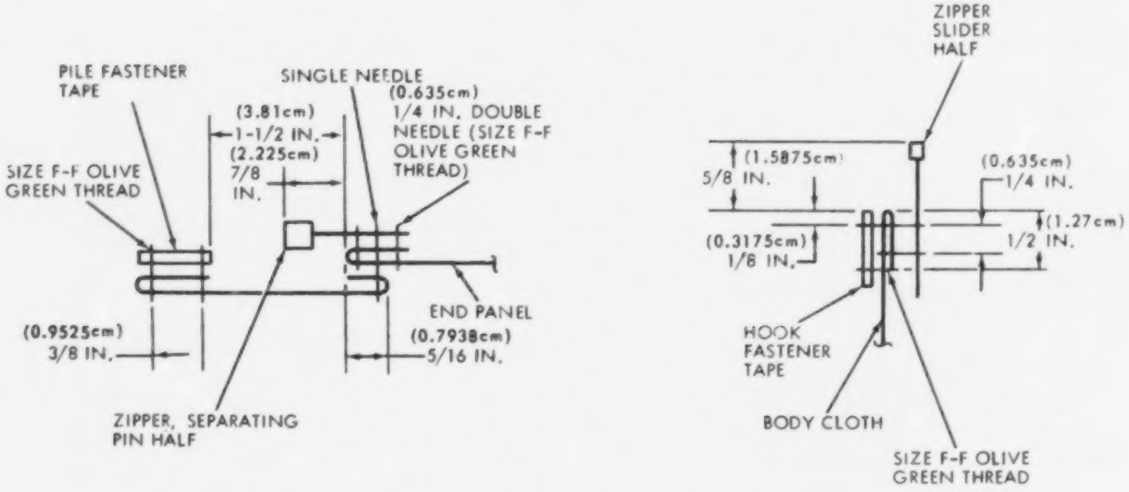
TS 013777

Figure 5-2. Air Lock Components Sewing (Sheet 1 of 2) (TS 013777)


SIZE F-F OLIVE GREEN THREAD
BODY CLOTH
COVER FLAP
(0.635cm) 1/4 IN.
PILE FASTENER TAPE
REINFORCING PATCH
HOOK FASTENER TAPE
SIZE F-F OLIVE GREEN THREAD
1 IN.
FABRIC DISC (0.9525cm x 2.54cm) 3/8 X 1 IN. BOXSTITCH 2 PLACES (SIZE F-F GREEN THREAD)
WEBBING
BODY CLOTH REF
(1.27cm) 1/2 IN.

E. ELECTRICAL PATCH ASSEMBLY

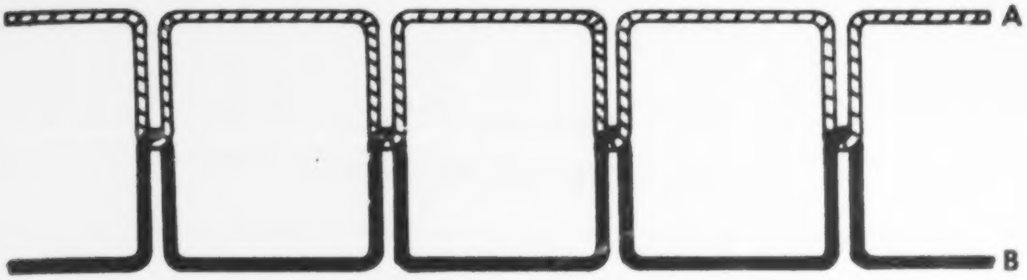
F. TIE PATCH ASSEMBLY


PILE FASTENER TAPE
SINGLE NEEDLE
(0.635cm) 1/4 IN. DOUBLE NEEDLE (SIZE F-F OLIVE GREEN THREAD)
(3.81cm) 1-1/2 IN.
(2.225cm) 7/8 IN.
SIZE F-F OLIVE GREEN THREAD
END PANEL
(0.9525cm) 3/8 IN.
(0.7938cm) 5/16 IN.
ZIPPER, SEPARATING PIN HALF
ZIPPER SLIDER HALF
(1.5875cm) 5/8 IN.
(0.635cm) 1/4 IN.
(1.27cm) 1/2 IN.
(0.3175cm) 1/8 IN.
HOOK FASTENER TAPE
BODY CLOTH
SIZE F-F OLIVE GREEN THREAD

G. ZIPPER ASSEMBLY

TS 013778

Figure 5-2. Air Lock Components Sewing (Sheet 2 of 2) (TS 013778)



TS013779

Figure 5-8. Stitch Type 301 (TS 013779)

CHAPTER 6

REPAIR OF ELECTRICAL SYSTEM

Section I. CABLE ASSEMBLIES REPAIR INSTRUCTIONS

6-1. General

This section contains the electrical cable assemblies used to connect an external electrical power source to the expandable shelter. They consist of a 60 Hertz input cable assembly and a 400 Hertz power input cable assembly.

WARNING

Personnel must observe extreme caution to avoid contact with electrical circuits when power source is connected. In case of accident from electrical shock, disconnect power source at once. If power source cannot be disconnected, free victim from live conductor with a board or other nonconductor. If victim in unconscious, apply artificial respiration and obtain medical help.

6-2. 60 Hertz and 400 Hertz Power Input Cable Assemblies

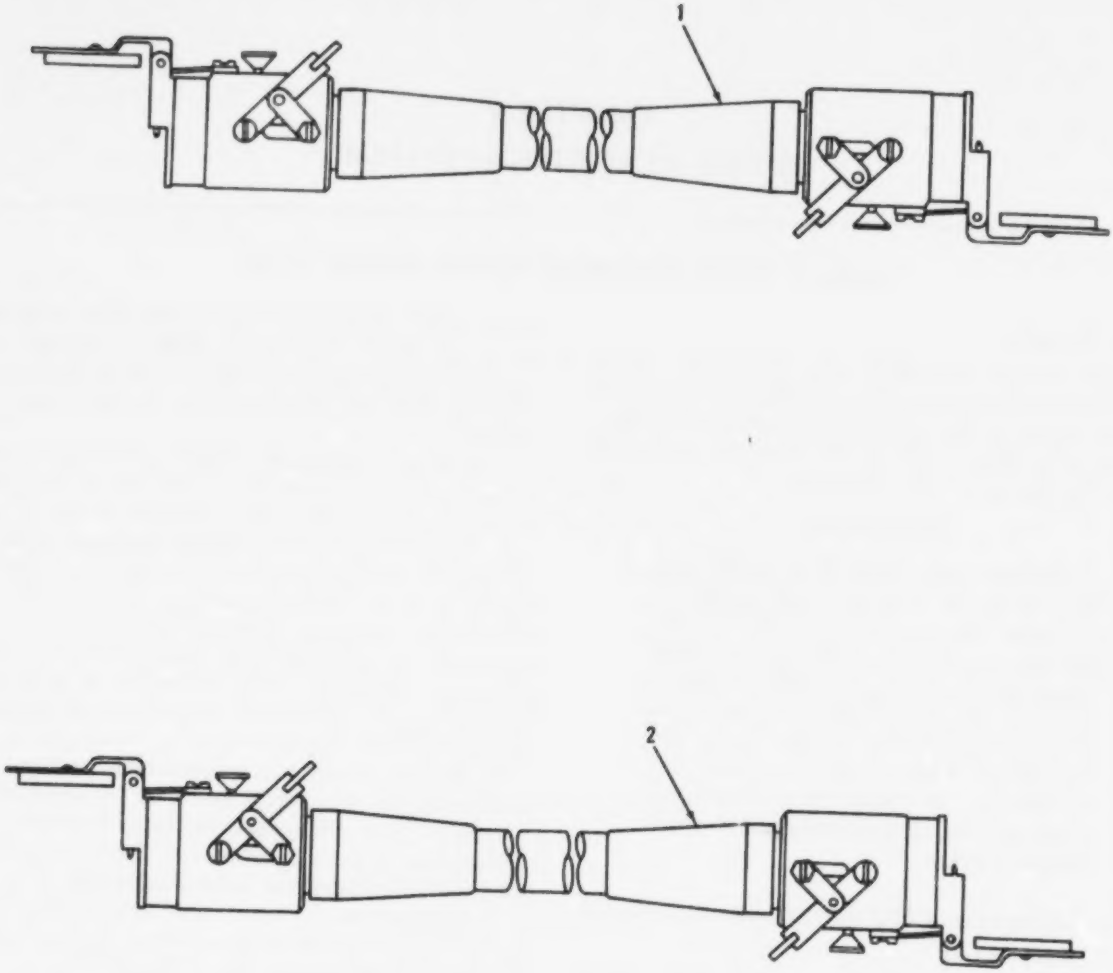
a. General. The 60 Hertz and 400 Hertz power input cable assemblies are heavy duty weather protected cable assemblies used to connect an electrical power source of 120/240 volt 60 Hertz and 120/208 volt 400 Hertz power to the electrical system.

b. Removal. Disconnect cable assemblies (1 and 2, fig. 6-1) from power source and power inlet (fig. 6-2) and power outlet panel assemblies (fig. 6-3).

c. Cable Assembly Test. Check continuity of cable assembly wires using a continuity light, multimeter (para 11-2), or other continuity checking device. Continuity must not exist between terminals and connector or between wires. Continuity must exist between connectors (wire terminal to wire terminal). If continuity check indicates a damaged or defective cable, replace cable.

d. Repair. Minor cuts or abrasions to the rubber insulation are acceptable and may be repaired by wrapping with vinyl electrical tape. Replace cable assemblies if cuts or abrasions have severed or otherwise damaged the individual wires.

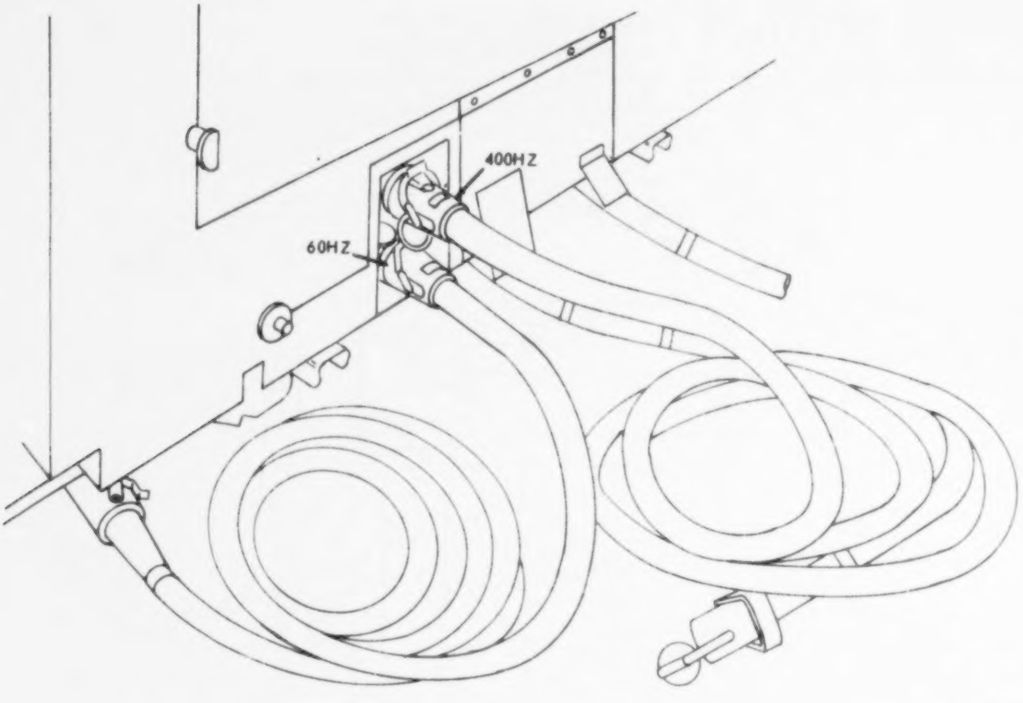
e. Installation. Connect cable assemblies (1 and 2, fig. 6-1) to power source and to power inlet or outlet panel assemblies (fig. 6-2 and 6-3).



TS013780

1. 60 Hertz power cable assembly
2. 400 Hertz power cable assembly

Figure 6-1. Electric Power Cable Assemblies (TS 013780)



TS013781

Figure 6-2. Power Input Panel (TS 013781)

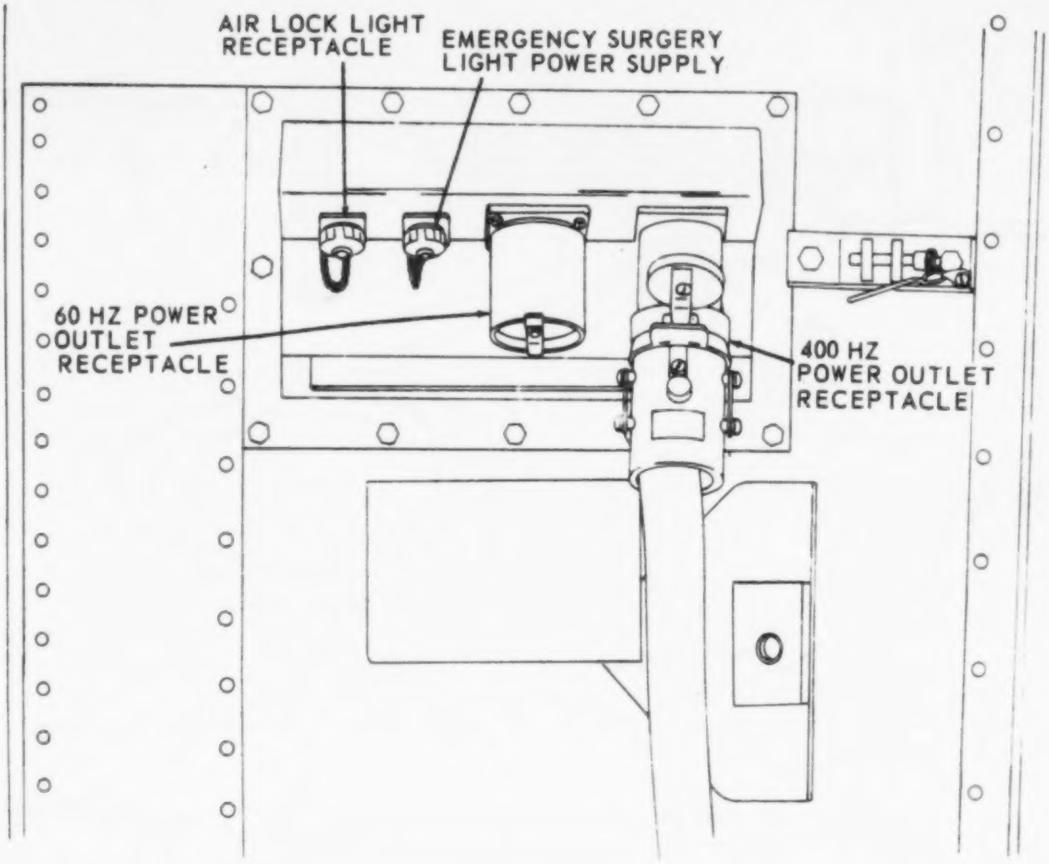

AIR LOCK LIGHT RECEPTACLE
EMERGENCY SURGERY LIGHT POWER SUPPLY
60 HZ POWER OUTLET RECEPTACLE
400 HZ POWER OUTLET RECEPTACLE
TS013782

Figure 6-3. Power Output Panel Assembly (TS 013782)

Section II. HARNESS ASSEMBLIES, WATER TUNNEL AND WIRE REPAIR INSTRUCTIONS

6-3. General

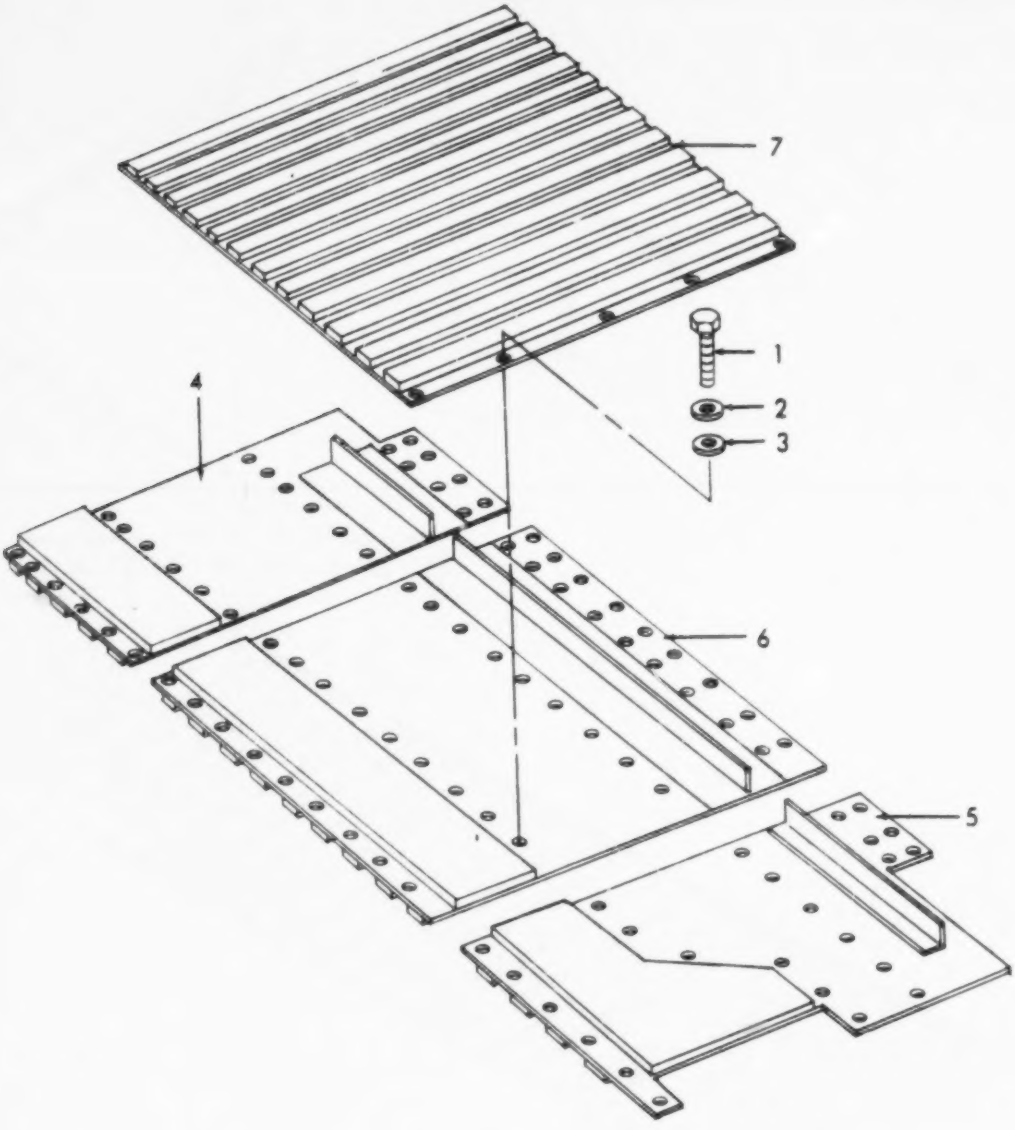
This section contains the electrical harness assemblies and wires used to interconnect the electrical components of the electrical system. They consist of a 400 Hertz and 60 Hertz power harness assemblies. Surgical and air lock lights harness assembly, lights harness assemblies, surgical lights harness assemblies, under floor heater harness assemblies and shelter loose wire assemblies.

NOTE

When removing the harness assemblies and loose wire assemblies from the shelter electrical raceways, an electrical wire or other flexible cable (fishing tool) must be tied to the harness or wire assembly end and pulled into the raceway as the harness or wire assembly is being pulled out. The connecting wire must be of sufficient strength to allow pulling the replacement harness into raceway during installation procedure. (Refer to FO-3 located in back of manual.) .

6-4. 400 Hertz (Power In) Harness and Connector Assembly (Water Tunnel)

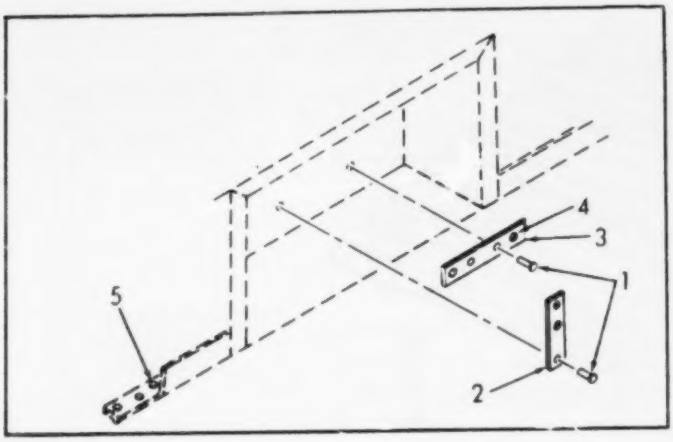
a. Removal. Jack up the shelter to gain enough height for access to the electrical cable raceway under the shelter and remove the access panels by removing bolts (1, fig. 6-4), washers (2 and 3) and panels (4, 5, 6, and 7).

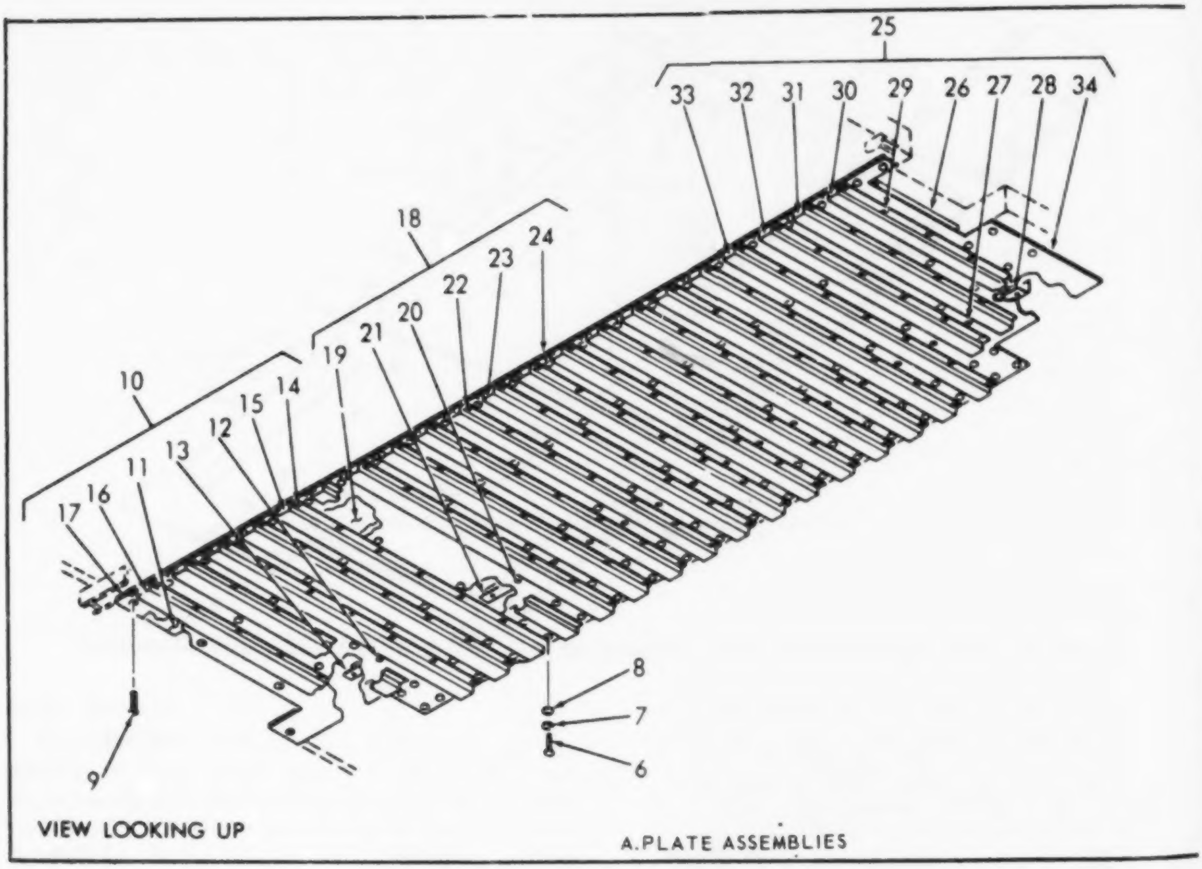


TS013783

1. Bolt
2. Washer
3. Washer
4. Panel
5. Panel
6. Panel
7. Panel

Figure 6-4. Water Tunnel Access Panels (TS 013783)

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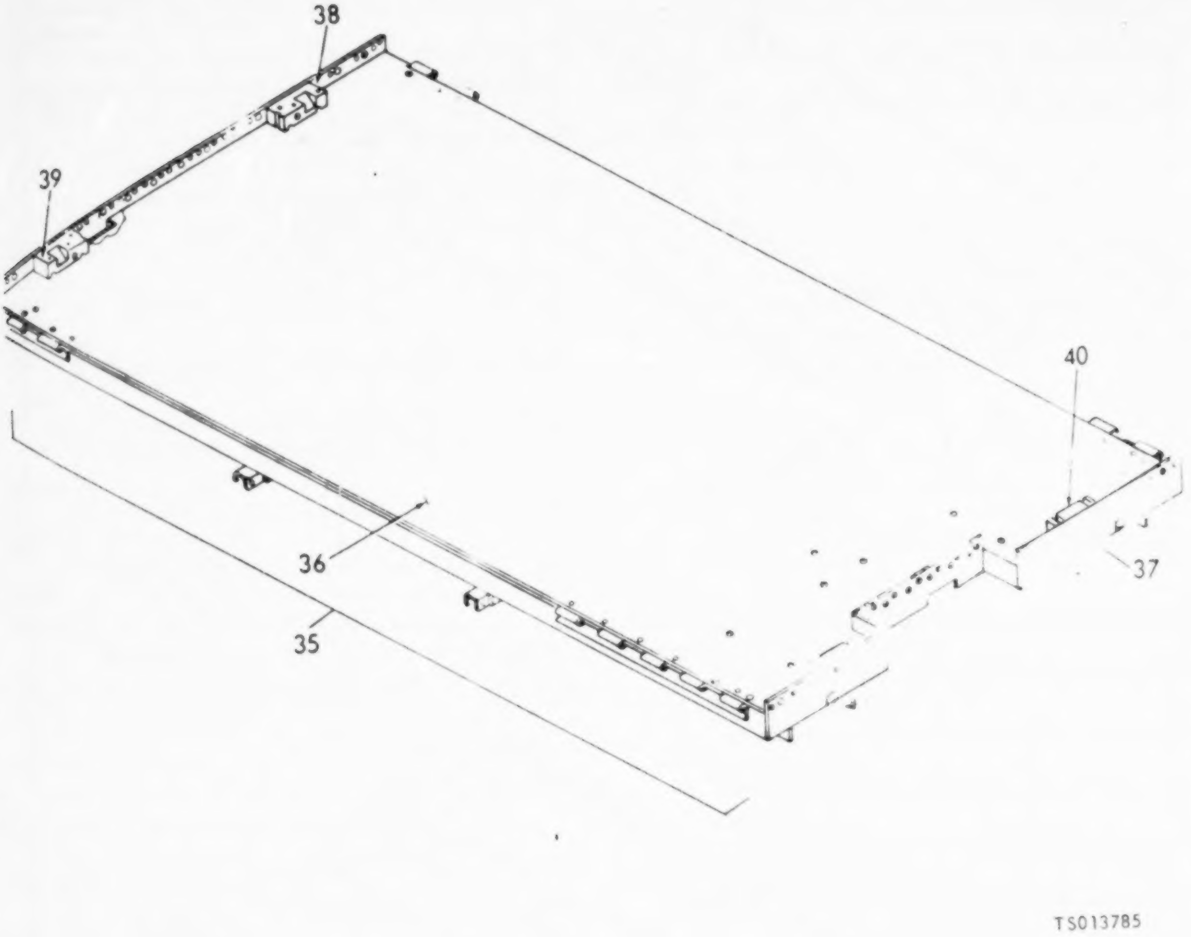
VIEW LOOKING UP
A.PLATE ASSEMBLIES

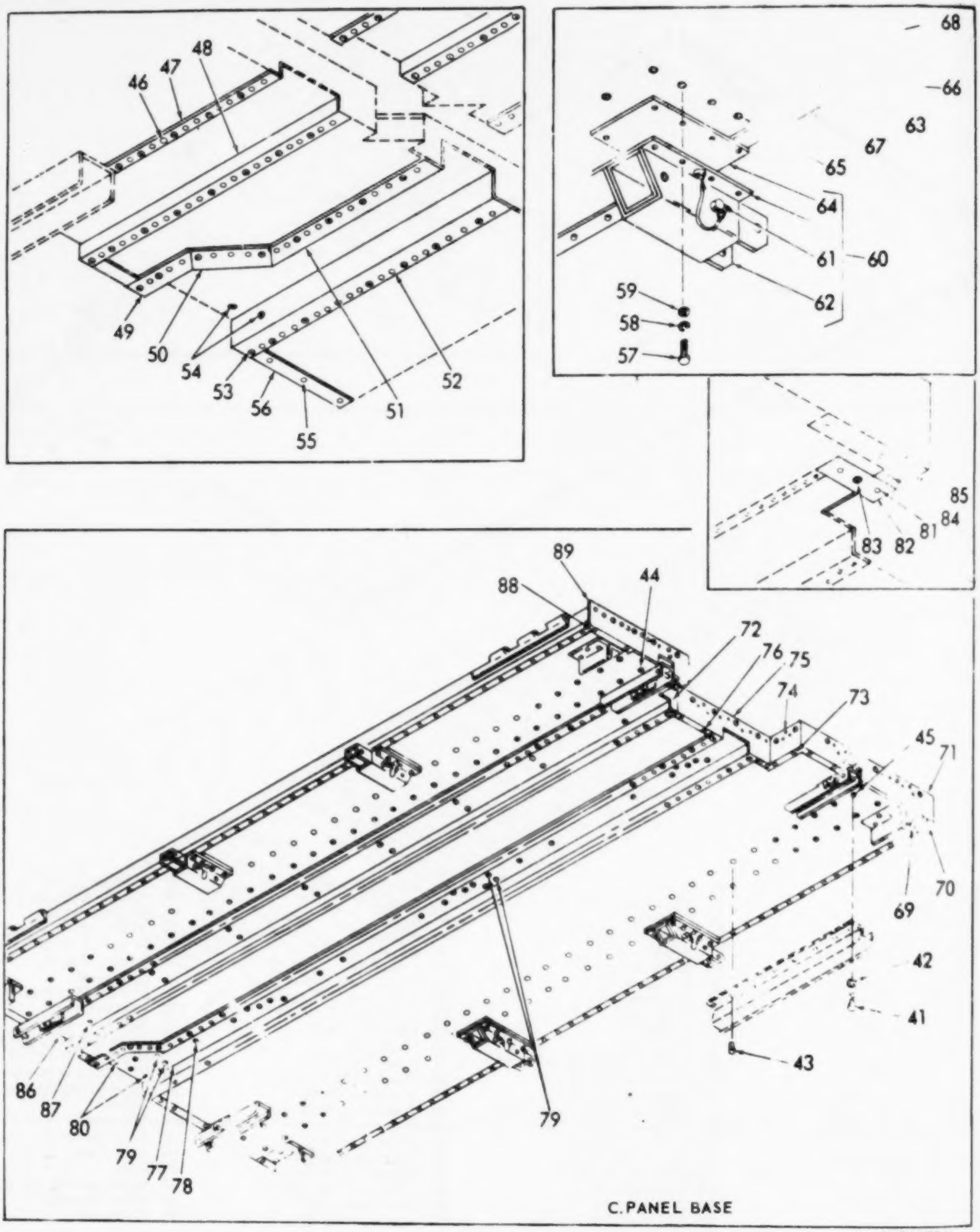
TS013784

Figure 6-5. Fixed Floor Panel Assembly, Disassembly (Sheet 1 of 3) (TS 013784)



1. Rivet (4 req'd)
2. Doubler
3. Doubler
4. Insert (26 req'd)
5. Rivet (11 req'd)
6. Screw (165 req'd)
7. Washer (165 req'd)
8. Washer (165 req'd)
9. Screw (3 req'd)
10. Plate assembly
11. Duct liner
12. Rivet (3 req'd)
13. Angle
14. Rivet (66 req'd)
15. Stiffener (3 req'd)
16. Stiffener (2 req'd)
17. Plate
18. Plate ay (2 req'd)
19. Duct liner
20. Rivet (12 req'd)
21. Angle
22. Rivet (168 req'd)
23. Stiffener (12 req'd)
24. Plate
25. Plate assembly
26. Duct liner
27. Rivet (4 req'd)
28. Angle
29. Rivet (50 req'd)
30. Stiffener
31. Stiffener
32. Stiffener
33. Stiffener
34. Plate
35. Fixed floor assembly
36. Screw (14 req'd)
37. Panel assembly
38. Block
39. Block
40. Block
41. Screw (36 req'd)
42. Washer (36 req'd)
43. Rivet (51 req'd)
44. Blind nut (31 req'd)
45. Blind nut (36 req'd)
46. Rivet (253 req'd)
47. Angle
48. Angle
49. Angle
50. Angle
51. Angle
52. Angle
53. Blind nut (134 req'd)
54. Blind nut (2 req'd)
55. Rivet (13 req'd)
56. Extrusion
57. Rivet (96 req'd)
58. Washer (32 req'd)
59. Washer (32 req'd)
60. Transport assembly
61. Pin
62. Slide assembly
63. Housing assembly
64. Spacer (4 req'd)
65. Blind nut (56 req'd)
66. Rivet (96 req'd)
67. Angle (2 req'd)
68. Closeout (2 req'd)
69. Blind nut (2 req'd)
70. Rivet (4 req'd)
71. Extrusion
72. Guard (2 req'd)
73. Rivet (7 req'd)
74. Extrusion
75. RIVET (4 req'd)
76. Extrusion
77. Base
78. Blind nut (24 req'd)
79. Blind nut (4 req'd)
80. Blind nut (3 req'd)
81. Rivet (2 req'd)
82. Angle
83. Blind nut
84. Rivet (6 req'd)
85. Extrusion
86. Base
87. Blind nut (16 req'd)
88. Rivet (4 req'd)
89. Extrusion

Figure 6-5. Fixed Floor Panel Assembly, Disassembly (Sheet 2 of 3) (TS 013785)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C.PANEL BASE

TS013786

Figure 6-5. Fixed Floor Panel Assembly, Disassembly (Sheet 3 of 3) (TS 013786)

b. Disassembly. Refer to figures 6-5 and 6-6 and disassemble as follows:

(1) Remove rivets (1, fig. 6-5, sheet 1 of 3) securing doublers (2 and 3), and remove inserts (4).

(2) Remove rivets (5).

(3) Remove screws (6), washers (7 and 8), and rivets (9); remove plate assembly (10).

(4) Disassemble plate assembly by removing duct liner (11), rivets (12), angle (13), rivets (14), stiffeners (15 and 16) and plate (17).

(5) Disassemble plate assembly (18) as follows:

(a) Remove duct liners (19), rivets (20), and angle (21).

(b) Remove rivets (22), stiffeners (23), and plate (24).

(6) Disassemble plate assembly (25) as follows:

(a) Remove duct liner (26), rivets (27), and angle (28).

(b) Remove rivets (29), stiffeners (30, 31, 32 and 33), and plate (34).

(7) Disassemble fixed floor assembly (35, fig. 6-5, sheet 2 of 3) by removing screws (36), panel assembly (37) and blocks (38, 39, and 40).

(8) Remove screws (41, fig. 6-5, sheet 3 of 3), washers (42), rivets (43), blind nuts (44 and 45) and angles (47, 48, 49, 50, 51 and 52).

(9) Remove blind nuts (53 and 54), rivets (55), and extrusion (56).

(10) Remove rivets (57), washers (58 and 59), and transporter assemblies (60).

(11) Remove pin (61), slide assembly (62), housing assembly (63) and spacers (64).

(12) Remove blind nuts (65), rivets (66), angles (67), and closeouts (68).

(13) Remove blind nuts (69), rivets (70) and extrusion (71).

(14) Remove guard (72), rivets (73), and extrusion (74).

(15) Remove rivets (75) and extrusion (76); remove base (77).

(16) Remove blind nuts (78, 79 and 80), rivets (81) and angle (82).

c. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

d. Assembly. Using figure 6-5, assemble items as follows:

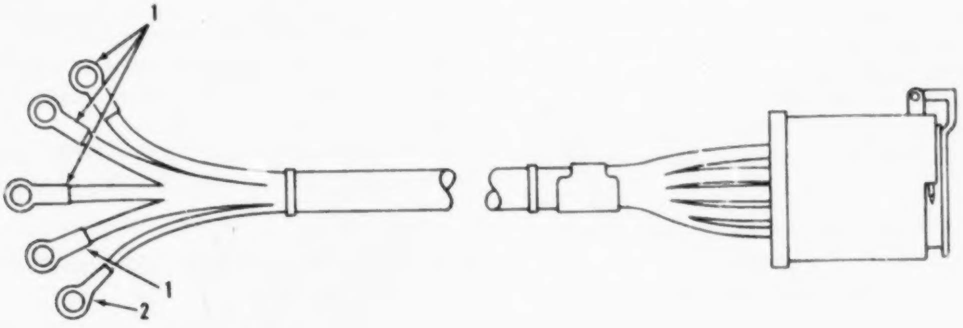
(1) Install extrusion (89, fig. 6-5, sheet 3 of 3), rivets (88) and nuts (87).

(2) Install base (86), extrusion (85), rivets (84), and blind nuts (83).

(3) Install angle (82), rivets (81), and blind nuts (78, 79 and 80).

(4) Install base (77), extrusion (76), and rivets (75).

(5) Install extrusion (74), rivets (73) and guard (72).



1. Terminal (4)
2. Terminal (1)

Figure 6-6. 400 Hertz Power In Harness Assembly (TS 013787)

(6) Install extrusion (71), rivets (70) and blind nuts (69).

(7) Install closeouts (68), angles (67), rivets (66) and blind nuts (65).

(8) Install spacers (64), housing assembly (63), slide assembly (62) and pin (61).

(9) Install transporter assemblies (60), washers (58 and 59) and rivets (57).

(10) Install extrusion (56), rivets (55), and blind nuts (53 and 54).

(11) Install angles (47, 48, 49, 50, 51 and 52), blind nuts (44 and 45), rivets (43), washers (42), and screws (41).

(12) Assemble fixed floor assembly (35, fig. 6-5, sheet 2 of 3), by installing blocks (38, 39 and 40), panel assembly (37), and screws (36).

(13) Install plate (34, fig. 6-5, sheet 1 of 3), stiffeners (30, 31, 32 and 33) and rivets (29).

(14) Install angle (28), rivets (27), and duct liner (26).

(15) Assemble plate assembly (18) by installing plate (24), stiffeners (23), rivets (22), angle (21), rivets (20) and duct liners (19).

(16) Assemble plate assembly (10), by installing plate (17), stiffeners (15 and 16), rivets (14), angle (13), rivets (12) and duct liner (11).

(17) Install rivets (9), washers (7 and 8), and screws (6).

(18) Install rivets (5).

(19) Install inserts (4), doublers (2 and 3), and rivets (1).

e. Test. Use a continuity light, multimeter, or other continuity checking device and check wire continuity. There must be continuity between corresponding terminals and connector pins. Continuity must not exist between pins or between pins and connector shell. If test indicates a defective connector, replace harness and connector assembly.

f. Installation. Jack up the shelter to gain enough height for access to the electrical cable raceway under the shelter and install the access panels (4, 5, 6 and 7, fig. 6-4) and secure with washers (2 and 3) and bolts (7).

6-5. 400 Hertz (Power Out) Wiring Harness and Connector Assembly

a. General. The 400 Hertz (power out) wiring harness and connector assembly provides for connection of additional shelters or for other external 120/208 volts, 400 Hertz power requirements to the power out box assembly. The wiring harness assembly consists of a connector and five electrical leads with terminals.

b. Removal.

(1) Remove the nuts, washers, and screws securing the 400 Hertz harness and connector assembly (8, FO-3) (located in back of manual) to the power out panel assembly.

(2) Remove the electrical lead from terminals 1 through 5 on terminal board (item 52, fig. 6-7, sheet 2 of 5) in the power distribution box.

(3) Remove cover from raceway adjacent to power out panel and remove all clamps securing the harness to the electrical raceway. Remove the harness and connector gasket.

c. Disassembly. Disassemble 400 Hertz harness and connector assembly as required to replace damaged terminals according to sequence of index numbers assigned to figure 6-8 and by removing terminals (1 and 2) from electrical leads.

d. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

e. Assembly. Assemble 400 Hertz harness and connector assembly in reverse order of disassembly using figure 6-8 as a guide; install terminals (1 and 2) and crimp to secure.

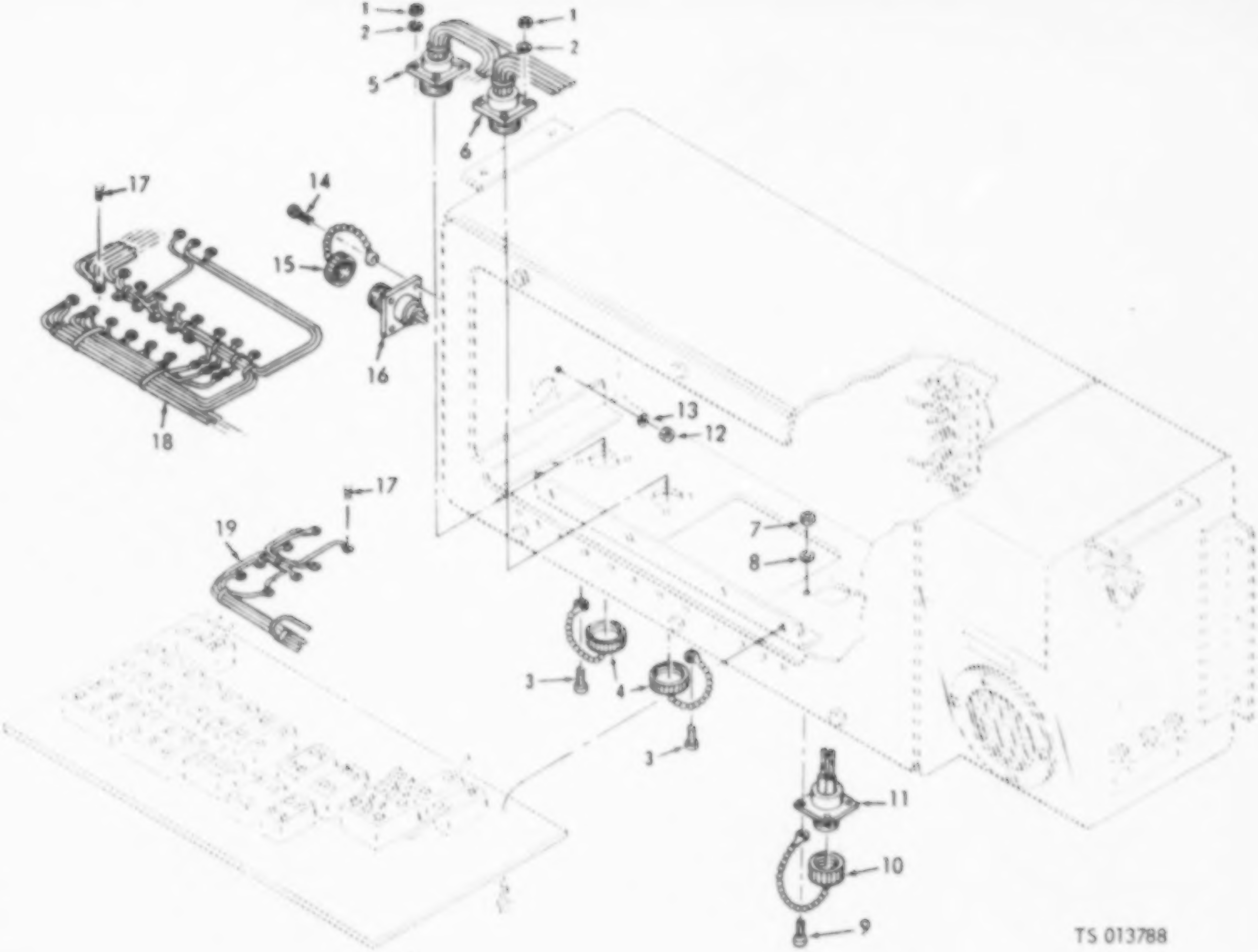
f. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device and check wire continuity. There must be continuity between corresponding terminals and connector pins. Continuity must not exist between connector pins or between pins and connector shell. If test indicates a defective connector or wires, replace harness assembly.

g. Installation. Install 400 Hertz power out harness assembly in reverse order of removal.

6-6. 60 Hertz (Power In) Harness and Connector Assembly

a. Removal. Remove the 60 Hertz (power in) harness and connector assembly (1, FO-3) (located in back of manual) using procedure given in paragraph 6-4*a*. (1) and (2) and observing the following.

(1) Disconnect electrical leads from terminals 1 through 5 on terminal board (item 60, fig. 6-7, sheet 2 of 5).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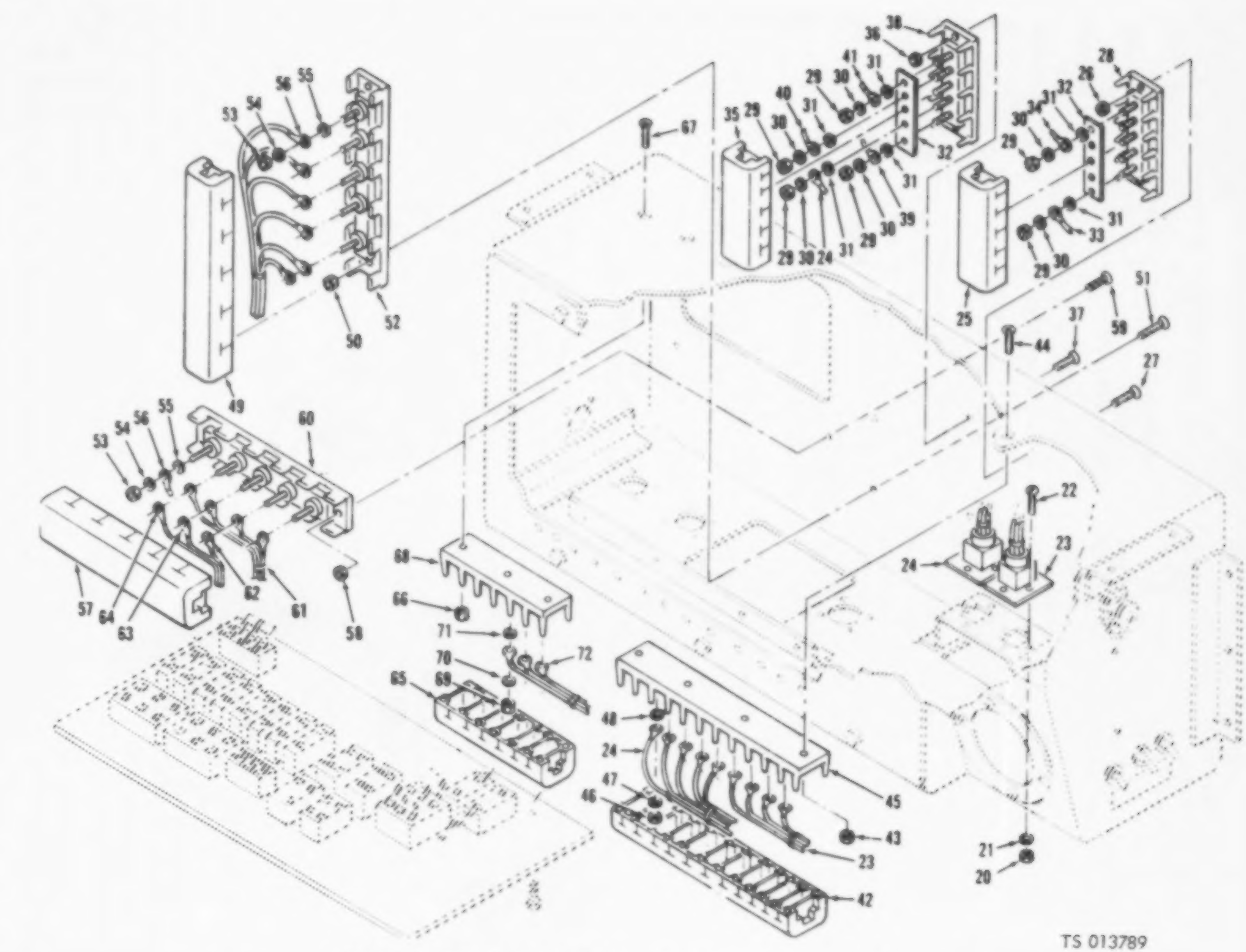
TS 013788

Figure 6-7. Power Distribution Box Assembly - Disassembly (Sheet 1 of 5) (TS 013788)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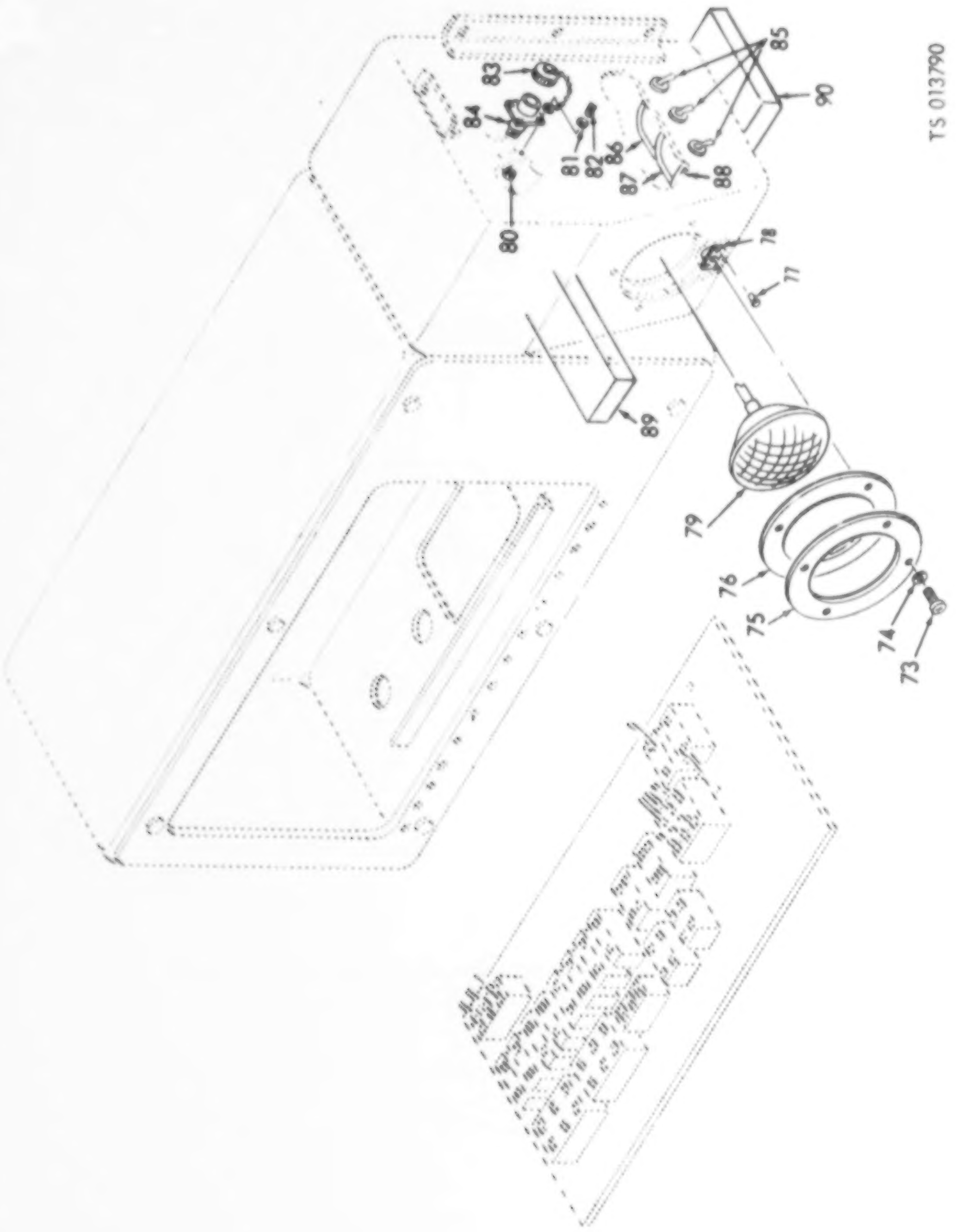
TS 013789

Figure 6-7. Power Distribution Box Assembly - Disassembly (Sheet 2 of 5) (TS 013789)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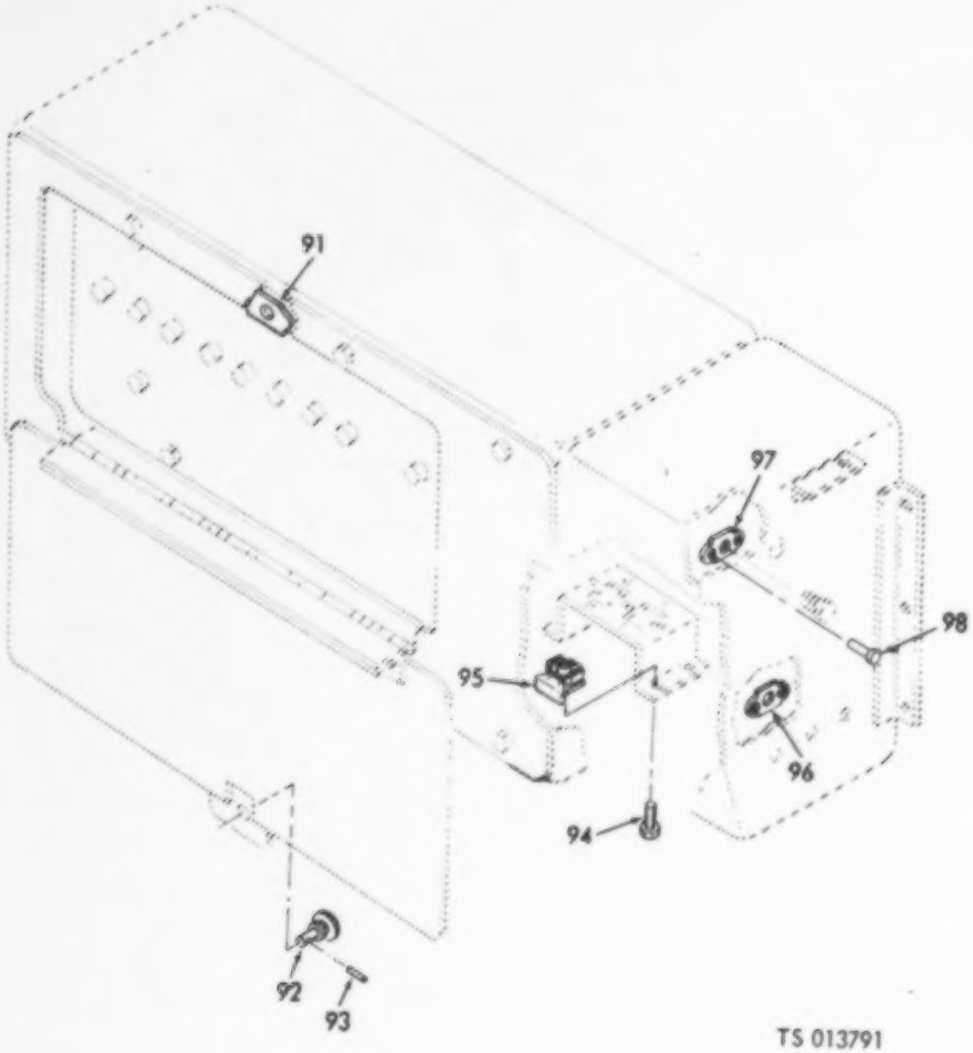
TS 013790

Figure 6-7. Power Distribution Box Assembly - Disassembly (Sheet 3 of 5) (TS 013790)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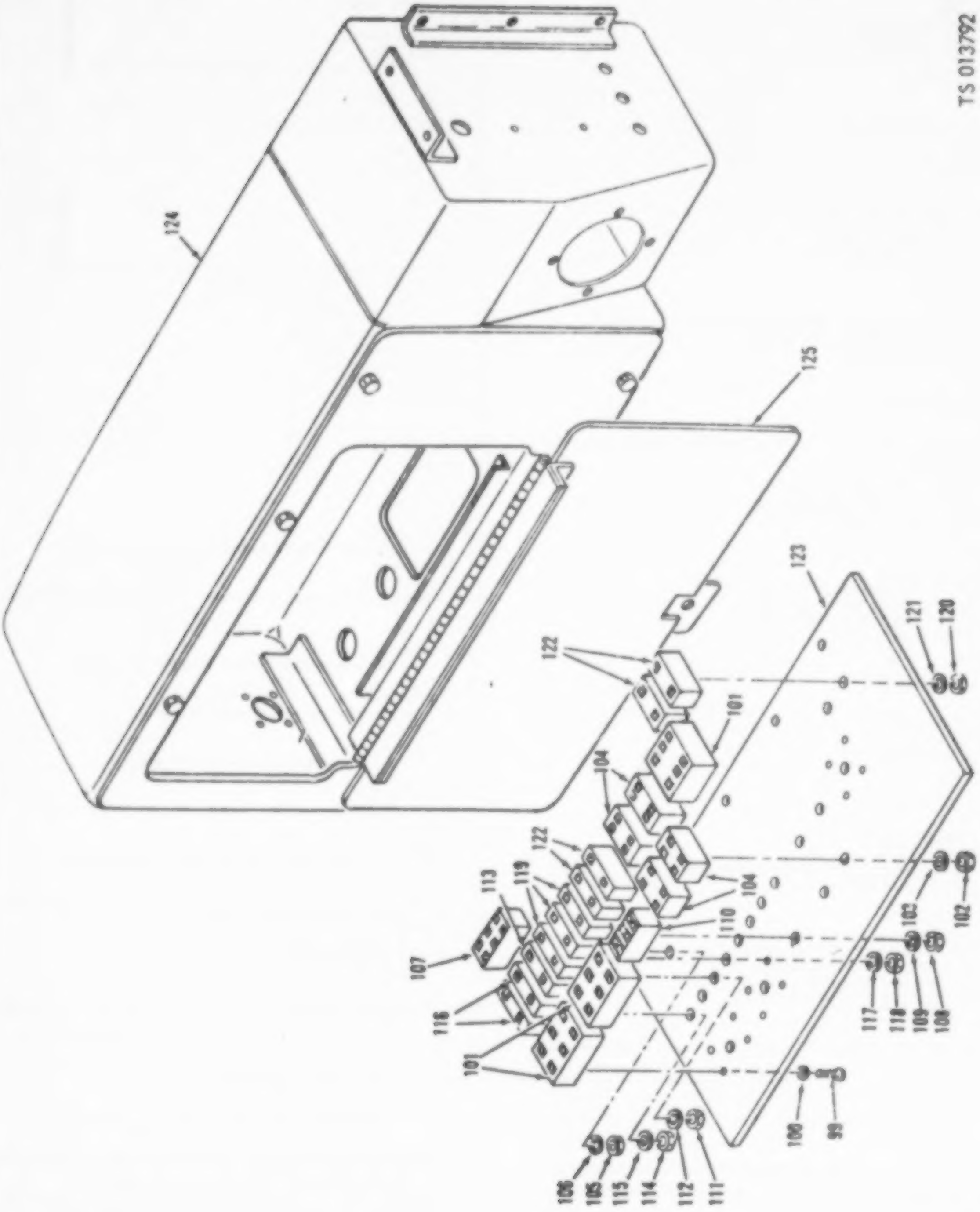
TS 013791

Figure 6-7. Power Distribution Box Assembly - Disassembly (Sheet 4 of 5) (TS 013791)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TS 013792

Figure 6-7. Power Distribution Box Assembly - Disassembly (Sheet 5 of 5) (TS 013792)

1. Nut (8)
2. Washer (16)
3. Screw (8)
4. Cover (2)
5. Sterilizer harness ay
6. Sterilizer harness ay
7. Nut (4)
8. Washer (8)
9. Screw (4)
10. Cover
11. X-ray wiring harness ay
12. Nut (4)
13. Washer (8)
14. Screw (4)
15. Cover
16. Humidifier harness ay
17. Screw (50)
18. 400 HZ wiring harness
19. 60 HZ wiring harness
20. Nut (8)
21. Washer (16)
22. Screw (8)
23. Upper case water line heater harness ay and relay
24. Humidifier harness ay and relay
25. Terminal board cover
26. Nut (3)
27. Screw (3)
28. Terminal board
29. Nut (10)
30. Lockwasher (10)
31. Washer (10)
32. Connector link
33. 400 Hertz wire and terminal ay
34. Sterilizer wire and terminal ay
35. Terminal board cover
36. Nut (3)
37. Screw (3)
38. Terminal board
39. 400 Hertz wire and terminal ay
40. Sterilizer wire and terminal ay
41. Sterilizer wire and terminal ay
42. Terminal board cover
43. Nut (4)
44. Screw (4)
45. Terminal board
46. Nut (11)
47. Lockwasher (11)
48. Washer (11)
49. Terminal board cover
50. Nut (3)
51. Screw (3)
52. Terminal board
53. Nut (10)
54. Lockwasher (10)
55. Washer (10)
56. 400 Hertz harness wire and terminal ays
57. Terminal board cover
58. Nut (3)
59. Screw (3)
60. Terminal board
61. 60 Hertz harness wire and terminal ays
62. X-ray wire and terminal assembly
63. X-ray wire and terminal assembly
64. X-ray wire and terminal assembly

*65. Terminal board cover
*66. Nut (3)
*67. Screw (3)
*68. Terminal board
*69. Nut (3)
*70. Lockwasher (6)
*71. Washer (3)
*72. Remote temperature sensor harness assembly
73. Screw (4)
74. Washer (4)
75. Retainer ring
76. Gasket
77. Rivet (8)
78. Nut plate (4)
79. Lamp
*80. Nut (4)
*81. Washer (8)
*82. Screw (4)
*83. Cover
*84. Remote temperature sensor harness ay connector
85. Surgical light toggle switches
86. Wire and terminal ay
87. Wire and terminal ay
88. Wire and terminal ay
89. Self adhesive label
90. Self adhesive label
91. Receptacle
92. Fastener stud
93. Pin
94. Bolt (4)
95. Clip nut (4)
96. Rivet
97. Nut plate
98. Nut plate
99. Screw (12)
100. Washer (12)
101. X-ray and sterilizers receptacle circuit breakers
102. Nut (4)
103. Washer (4)
104. 60 Hertz ceiling and wall convenience receptacles circuit breakers
105. Nut (1)
106. Washer (1)
107. Humidifier receptacle circuit breaker
108. Nut (1)
109. Washer (1)
110. Sump pump receptacle circuit breaker
111. Nut (1)
112. Washer (1)
113. Air-lock light receptacle circuit breaker
114. Nut (2)
115. Washer (2)
116. Surgical and fluorescent lights circui breaker
117. Nut (3)
118. Washer (3)
119. Water hose and water line heater circuit breakers
120. Snut (2)
121. Washer (2)
122. 400 Hertz convenience receptacles and surgical lights circuit breakers
123. Circuit breaker panel
124. Distribution box
125. Circuit breaker panel cover

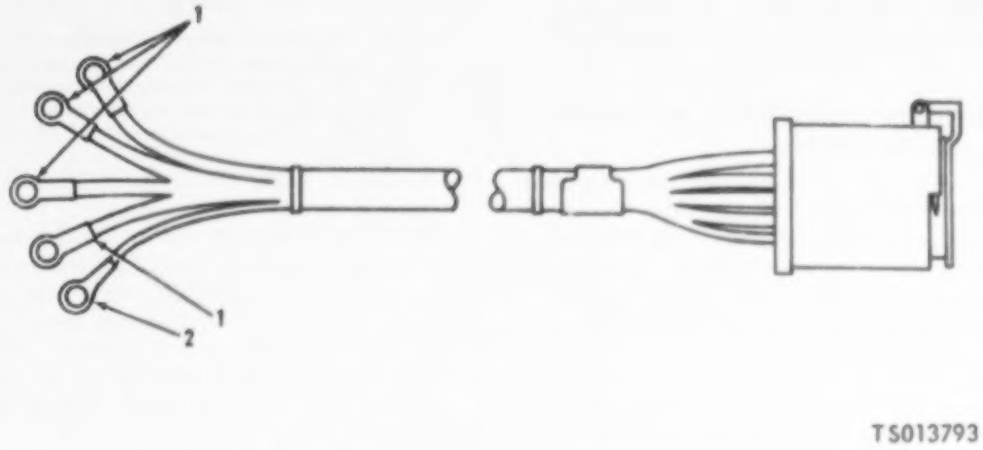
*Serial No.1 thru 184 only.

Figure 6-7 — Continued.

(2) Remove the nuts, washers and screws securing the 60 Hertz harness and connector assembly (1, FO-3) (located in back of manual) to the power inlet panel.

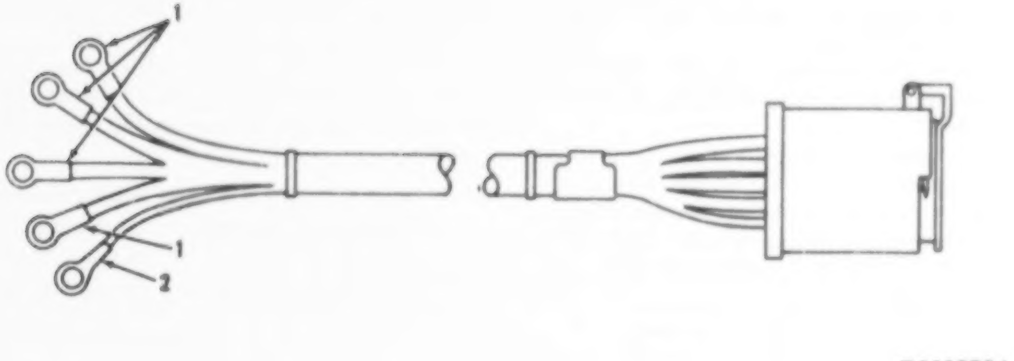
b. Disassembly. Disassemble power harness assembly as required to replace damaged terminal according to sequence of index numbers assigned to figure 6-9 and by removing terminals (1 and 2).

c. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape.



1. Terminal (4)
2. Terminal (1)

Figure 6-8. 400 Hertz Power Out Harness Assembly (TS 013793)



1. Terminal (4)
2. Terminal (1)

Figure 6-9. 60 Hertz Power In Harness Assembly (TS 013794)

Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

d. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check wiring continuity. Continuity must exist between connector pins and corresponding terminal. Continuity must not exist between connector pins or between connector pins and connector shell. If test indicates a defective connector or wires, replace harness assembly.

e. Installation. Install 60 Hertz power harness assembly as follows:

(1) Install the nuts, washers and screws to secure the 60 Hertz harness and connector assembly (1, FO-3) (located in back of manual) to the power inlet panel.

(2) Connect electrical leads to terminals 1 through 5 on terminal board (item 60, fig. 6-7, sheet 2 of 5).

6-7. 60 Hertz (Power Out) Wiring Harness and Connector Assembly

a. General. The 60 Hertz (power out) wiring harness and connector assembly provides for connection of additional shelters or for other external 120/240 volts, 60 Hertz power requirements to the power out box assembly. The wiring harness assembly consists of a connector and five electrical leads with terminals.

b. Removal.

(1) Remove the nuts, washers and screws securing the 60 Hertz harness and connector (9, FO-3) (located in back of manual) to the power out panel assembly.

(2) Remove the electrical leads from terminals 1 through 5 on terminal board (item 60, fig. 6-7, sheet 2 of 5) in the power distribution box.

(3) Remove cover from raceway adjacent to power out panel and remove all clamps securing the harness to the electrical raceway and remove harness and connector gasket.

c. Disassembly. Disassemble power harness assemblies as required to replace damaged parts. Refer to fig. 6-10.

d. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

e. Assembly. Refer to figure 6-10 and install terminals (1 and 2).

f. Test. Use continuity light, multimeter (para 11-2), or other continuity checking device to check wiring continuity. Continuity must exist between connector pins and corresponding terminal. Continuity msut not exist between connector or between connector pins and connector shell. If test indicates a defective connector or wires, replace harness assembly.

g. Installation. Install 60 Hertz power harness assemblies as follows:

(1) Install cover to raceway adjacent from power out panel and install all clamps to secure the harness to the electrical raceway and install harness and connector gasket.

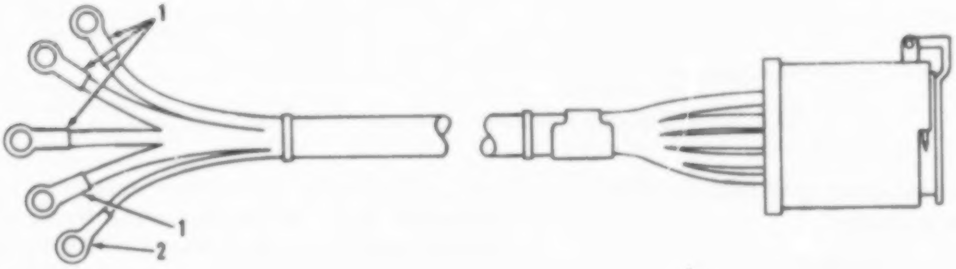
(2) Install the electrical leads to terminals 1 through 5 on termfinal board (item 60, fig. 6-7, sheet 2 of 5) in the power distribution box.

(3) Install the nuts, washers and screw to secure the 60 Hertz harness and connector (9, FO-3) (located in back of manual) to the power out panel assembly.

6-8. Surgical and Air Lock Lights Harness and Connector Assembly

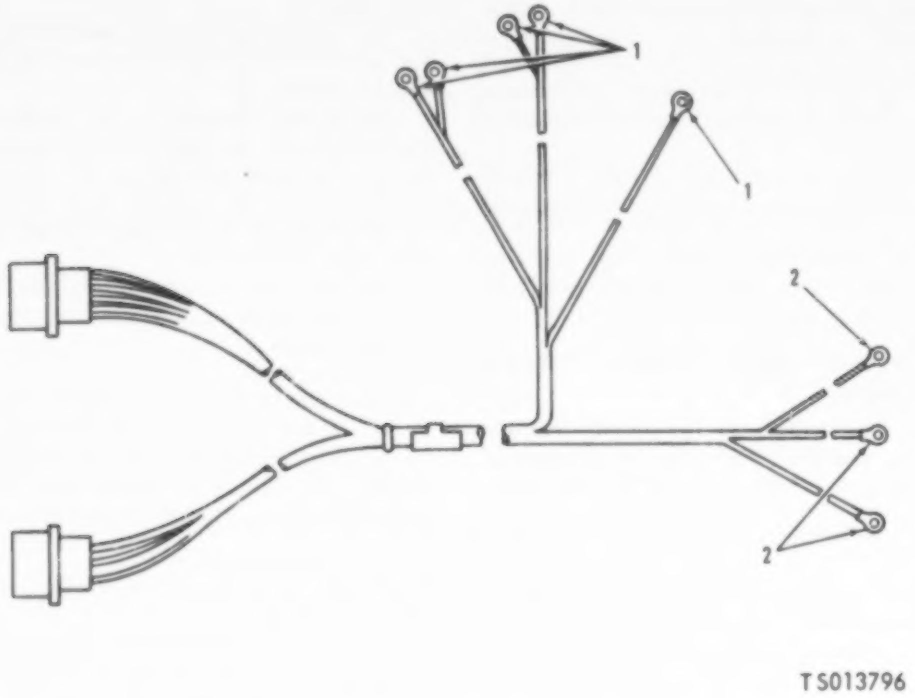
a. Removal.

(1) Disconnect terminals (1 and 2, fig. 6-11)



1. Terminal (4)
2. Terminal (1)

Figure 6-10. 60 Hertz Power Out Harness Assembly (TS 013795)



1. Terminal (5)
2. Terminal (3)

Figure 6-11. Surgical and Air Lock Lights Harness Assembly (TS 013796)

from terminal boards (items 28, 38 and 45, fig. 6-7, sheet 2 of 5) inside power distribution box.

(2) Remove cover from raceway adjacent to power out panel and remove clamps securing the harness to the raceway.

NOTE

Tag or otherwise identify electrical leads as to connection point for aid at installation.

(3) Remove nuts, washers and screws securing the surgical and air lock lights harness and connector assembly (7, FO-3)(located in back of manual) to the output assembly.

(4) Pull the surgical and air lock lights harness assembly from the shelter.

b. Disassembly.

(1) Remove terminals (1, fig. 6-11).

(2) Remove terminals (2).

c. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

d. Assembly. Assemble harness assembly using Figure 6-11 as a guide observing the following.

(1) Install terminals (1) on wires and crimp to secure.

(2) Install terminals (2) on wires and crimp to secure.

e. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check wiring continuity. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. If test indicates a defective connector or wire, replace the harness assembly.

f. Installation. Install harness assembly as follows:

(1) Install the surgical and air lock lights harness assembly to the shelter.

(2) Install nuts, washers and screws to secure the surgical and air lock lights harness and connector assembly (7, FO-3) (located in back of manual) to the output assembly.

(3) Install cover to raceway adjacent to power out panel and install clamps to secure the harness to the raceway.

(4) Connect terminals (1 and 2, fig. 6-11) to terminal boards inside power distribution box (items 28, 38 and 45, fig. 6-7, sheet 2 of 5).

6-9. Fluorescent Light Female Harness Assemblies

a. General. The fluorescent light female harness assemblies (11 and 12, FO-3) (located in back of manual) consist of a female connector and three electrical leads.

b. Removal.

(1) Disconnect harness assemblies (11 and 12, fig. FO-3) from receptacle boxes located on the shelter ceiling.

(2) Remove screws (1, fig. 6-12) and remove cover plates (2). Remove screws (3) and yoke (4) and remove harness assemblies (11 and 12, FO-3) (located in back of manual), from junction box.

(3) Disconnect terminals (1 and 2, fig. 6-13) from light and switch.

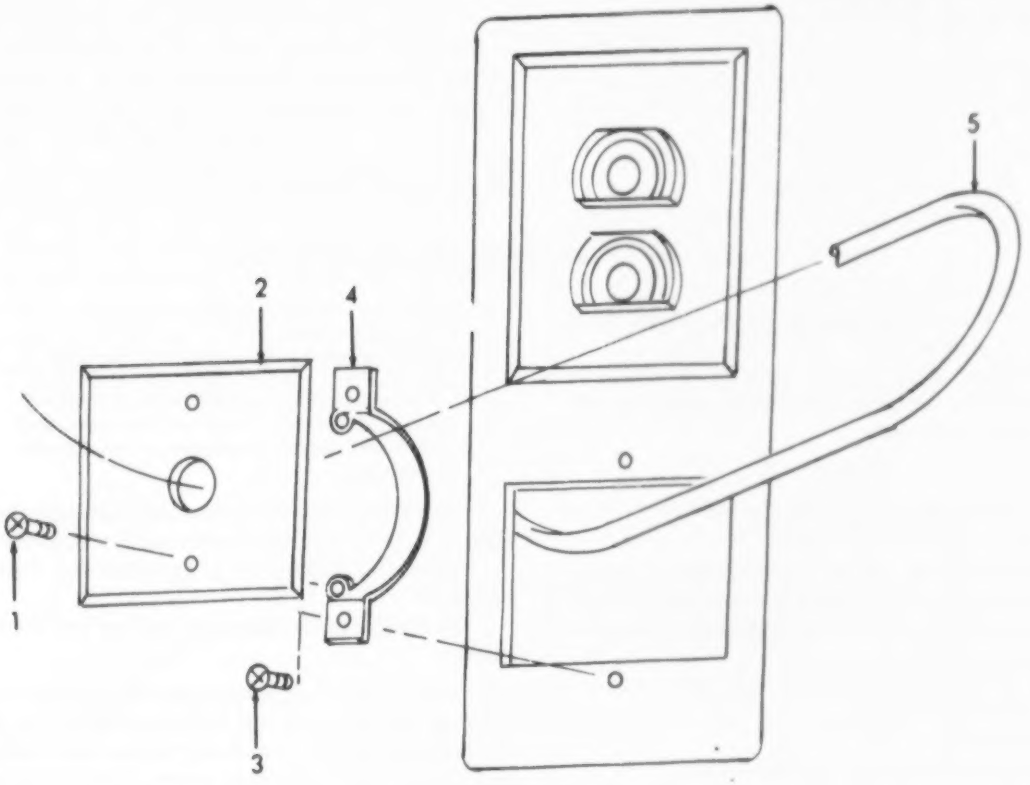
(4) Pull the harness assemblies (11 and 12, FO-3) (located in back of manual) from electrical wiring raceways.

c. Disassembly.

(1) Remove terminals (1 and 2, fig. 6-13).

(2) Remove hood (3) from harness.

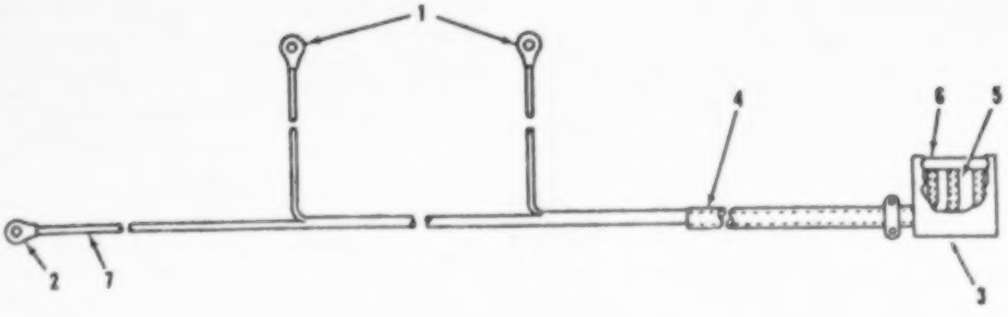
(3) Slide insulation sleeving (4 and 5) back to expose soldered wire connections to connector receptacle (6). Unsolder connections and remove



TS013797

1. Screw (2)
2. Cover plate
3. Screw
4. Yoke
5. Female fluorescent harness assembly

Figure 6-12. Fluorescent Lights Junction Box, Disassembly (TS 013797)



TS013798

1. Terminal (2)
2. Terminal (1)
3. Hood
4. Sleeving, insulation
5. Sleeving, insulation
6. Receptacle
7. Wire

Figure 6-13. Fluorescent Light Female Harness Assembly, Disassembly (TS 013798)

wires (7) from receptacle (6). Remove sleeving (4 and 5).

d. Repair. Inspect wires and insulation sleeving for abrasions and cuts. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace individual wires if cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

e. Assembly. Using figure 6-13 as a guide, assemble the light wiring harness as follows:

(1) Install insulation sleeving (4 and 5) over wires (7) and push back to expose connection end. Solder wires (7) to receptacle (6) according to Specification MIL-S-6872 using Sn60 solder that conforms to Federal Specification QQ-S-571. Slide insulation sleeving (4 and 5) over soldered connection points.

NOTE

Install wires on connector pins according to figure 6-13. If wires are replaced, mark wire location number from removed wire onto replacement wire.

(2) Install terminals (1 and 2) on wires and crimp to secure.

(3) Install hood (3) on receptacle (6).

f. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring (fig. 6-13). Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. If continuity does not exist between end fittings on individual wires, replace wire or connector.

g. Installation. Install female harness assemblies as follows:

(1) Install the harness assemblies (11 and 12, FO-3) (located in back of manual) to electrical wiring raceways.

(2) Connect terminals (1 and 2, fig. 6-13) to light and switch.

(3) Install screws (3) and yoke (4) and install harness assemblies (11 and 12, FO-3) (located in back of manual) to junction box. Install screws (1) and install cover plates (2)

(4) Connect harness assemblies (11 and 12, FO-3) to receptacle boxes located on the shelter ceiling.

6-10. Florescent Light Male Harness Assemblies

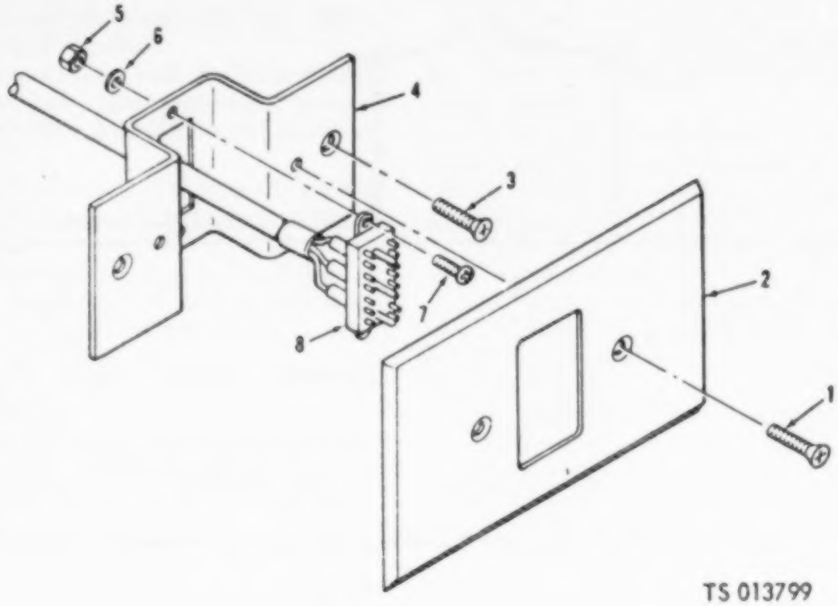
a. General. The male fluorescent light harness assemblies (13 and 14, FO-3) (located in back of manual) consist of a male connector and three electrical leads.

b. Removal.

(1) Disconnect harness connectors (13 and 14, FO-3) from receptacle boxes on the shelter ceiling.

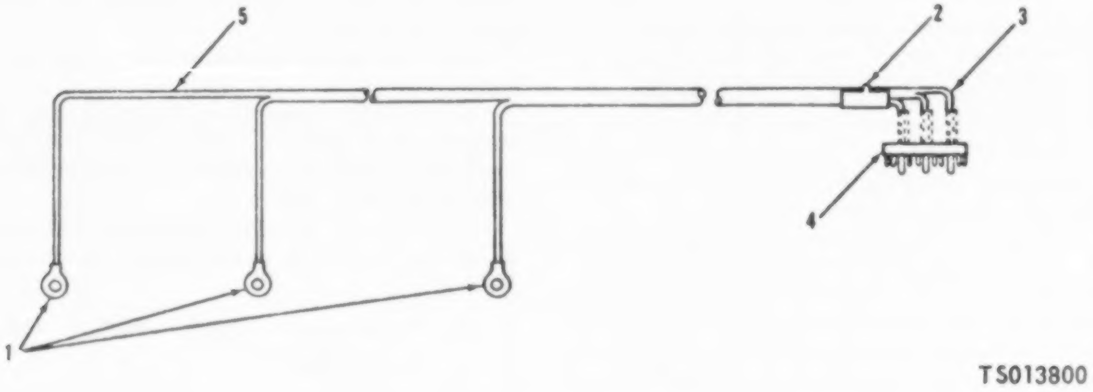
(2) Remove screws (1, fig. 6-14) and cover plates (2) from receptacle boxes and remove screw (3) and bracket (4). Separate male harness (8) from bracket (4) by removing nut (5), washer (6) and screw (7).

(3) Disconnect terminals (1, fig. 6-15) from light assemblies.



1. Screw (2)
2. Cover plate
3. Screw (2)
4. Bracket
5. Nut (2)
6. Washer (2)
7. Screw (2)
8. Male fluorescent harness connector assembly

Figure 6-14. Fluorescent Lights Receptacle Box, Disassembly (TS 013799)



1. Terminal (3)
2. Strap, identification
3. Sleeving, insulation
4. Connector
5. Wire

Figure 6-15. Fluorescent Lights Male Harness Assembly (TS 013800)

(4) Pull harness assemblies (13 and 14, FO-3) (located in back of manual) from the electrical wiring raceways.

c. Disassembly.

(1) Remove terminals (1, fig. 6-15).

(2) Remove identification strap (2).

(3) Slide insulation sleeving (3) back to expose soldered wire connections to connector (4). Unsolder connections and remove wires (5) from connector. Remove sleeving (3).

d. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace individual wires if cut or otherwise damaged. Inspect connector for any conductive wire or debris between connector pins which may cause a short and remove if required.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

e. Assembly. Using figure 6-15 as a guide, assemble the light wiring harness (13 and 14, FO-3) (located in back of the manual) as follows:

(1) Install insulation sleeving (3, fig. 6-15) over wires (5) and push back to expose connection end. Solder wires (5) to connector (4) according to Specification MIL-S-6872 using Sn60 solder that conforms to Specification QQ-S-571. Slide insulation sleeving (3) over soldered connection points.

(2) Install terminals (1) on wires (5) and crimp to secure.

(3) Install identification strap (2) around wires (5).

f. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. If continuity does not exist between end fittings on wires replace wire or connector.

g. Installation. Install male fluorescent light harness assemblies using figure 6-15 as a guide.

(1) Connect harness assemblies (13 and 14, FO-3) (located in back of manual) to the electrical wiring raceways.

(2) Connect terminals (1, fig. 6-15) to light assemblies.

(3) Joining male harness (8) to bracket (4) by installing nut (5), washer (6) and screw (7).

(4) Connect harness connectors (13 and 14, FO-3) to receptacle boxes on the shelter ceiling.

6-11. Surgical Light Wire Harness Assemblies

a. General. The surgical light wire harness assemblies (15, 16 and 17, FO-3) (located in back of manual) consists of a connector receptacle and three electrical leads to provide interconnection from the power distribution box to the surgical light switches and the surgical lights when used.

b. Removal.

(1) Remove screw (1, fig. 6-14) and remove receptacle box covers (2) from receptacle boxes.

(2) Remove screw (3) and bracket (4) from receptacle box.

(3) Remove nut (5), washer (6) and screw (7) and remove harness (8) from receptacle box.

(4) Disconnect terminals (1 and 2, fig. 6-16) from appropriate terminal boards and switches in power distribution box.

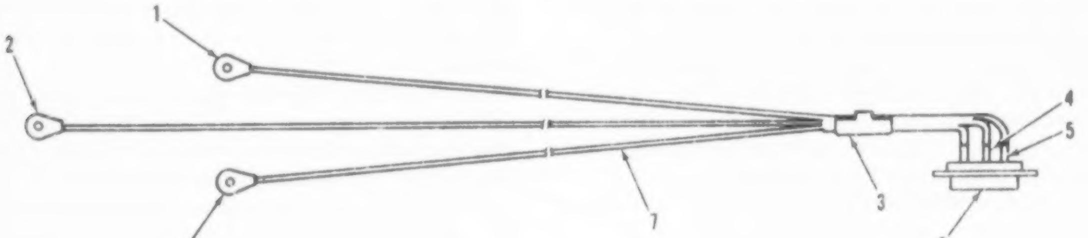
(5) Pull the harness assemblies (15, 16 and 17, FO-3) (located in back of manual) from the electrical wiring raceways.

c. Disassembly.

(1) Remove terminals (1 and 2, fig. 6-16).

(2) Remove identification strap (3).

(3) Slide insulation sleeving (4) back to expose soldered wire connections to contact socket (5). Unsolder connections and remove wires (7) from connector (6). Remove sleeving (4).



TS013801

1. Terminal (6, 2 per assy)
2. Terminal (3, 1 per assy)
3. Strap, identification
4. Sleeving, insulation
5. Contact, socket (9, 3 per assy)
6. Connector (3, 1 per assy)
7. Wire

Figure 6-16. Surgical Lights Receptacle Box, Dissembly (TS 013801)

d. Assembly. Using figure 6-16 as a guide, assemble the light wiring harness as follows:

(1) Install insulation sleeving (4, fig. 6-16) over wires (7) and push back to expose connection end. Solder wires (7) to connector (6) according to Specification MIL-S-6872 using Sn60 solder that conforms to Specification QQ-S-571. Slide insulation sleeving (4) over soldered connection points.

(2) Install terminals (1 and 2) on wires and crimp to secure.

(3) Install identification strap (3) around wires (7).

e. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. Replace wire or connector if continuity does not exist between wire ends.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged. Inspect connector for conductive debris or wires between connector pins which may cause a short and remove if required.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

g. Installation. Install the surgical light harness assemblies as follows:

(1) Install the harness assemblies (15, 16 and 17, FO-3) (located in back of manual) to the electrical wiring raceways.

(2) Connect terminals (1 and 2, fig. 6-16) to appropriate terminal boards and switches in power distribution box.

(3) Install nut (5), washer (6) and screw (7) and install harness (8) to receptacle box.

(4) Install screw (3) and bracket (4) to receptacle box.

(5) Install screw (1, fig. 6-14) and install receptacle box covers (2) to receptacle boxes.

6-12. Underfloor Heaters and Water System Power Harness Assembly

a. General. The underfloor heaters and water system power harness assembly (3, FO-3) (located in back of manual) consists of six connectors and fourteen electrical leads to provide interconnection between the power distribution box and water system heaters, sump pump and air lock light receptacle located in the water box and water tunnel areas.

b. Removal.

(1) Jack up the expandable shelter to gain access to the electrical cable raceway under the shelter and remove the raceway access panels (fig. 6-4).

(2) Remove clamps used to secure harness to electrical raceway.

(3) Remove electrical leads of wiring harness assembly from terminals circuit breakers. Remove electrical leads from terminals of terminal boards as necessary using figure 6-17 as a guide.

(4) Remove nuts, washers and screws securing connectors to water box assembly and remove harness from shelter (FO-3) (located in back of manual).

c. Disassembly. Disassemble wiring harness as required for replacement of damaged parts by removing terminals (1 and 2, fig. 6-17) from electrical leads.

d. Assembly. Assemble wiring harness using figure 6-17 as a guide and by installing terminals (1 and 2) and crimping to secure.

e. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. If test indicates a defective connector or wires, replace harness.

f. Installation. Install wiring harness assembly as follows:

(1) Install nuts, washers and screws to secure connectors to water box assembly and install harness to shelter (FO-3) (Located in back of manual).

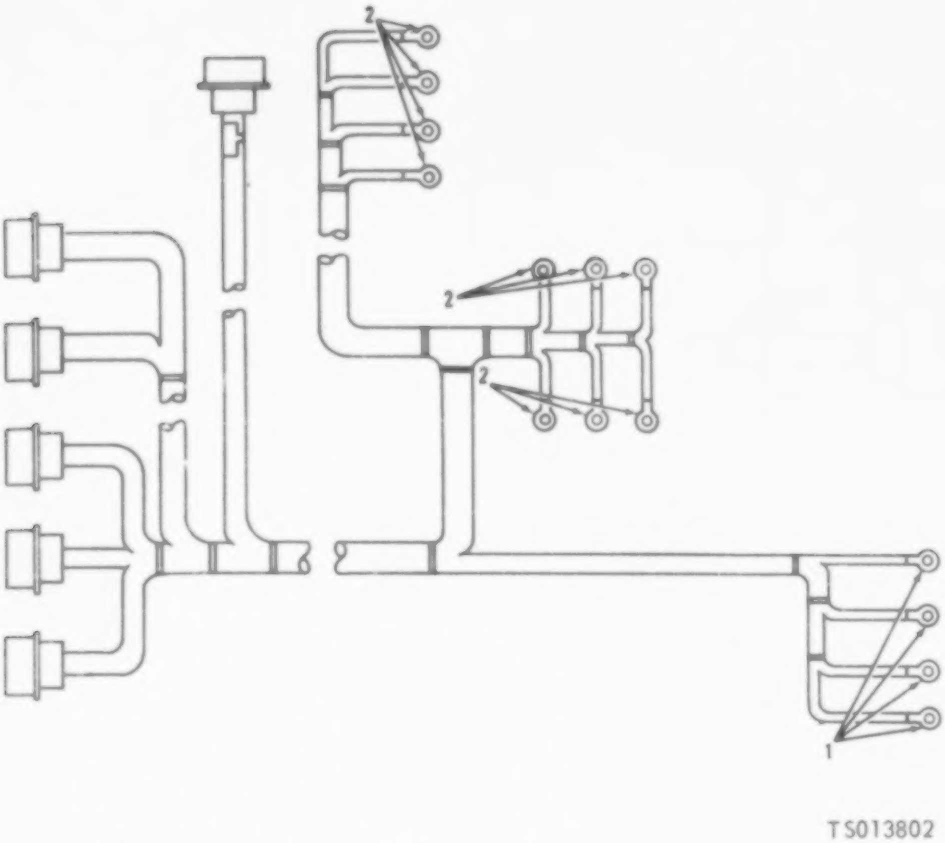
(2) Install electrical leads to terminals of terminal boards as necessary using figure 6-17 as a guide. Install electrical leads of wiring harness assembly to terminals circuit breakers.

(3) Install clamps to secure harness to electrical raceway.

(4) Jack up the expandable shelter to gain access to the electrical cable raceway under the shelter and install the raceway access panels (fig. 6-4).

6-13. Water Box Heater Harness Assembly

a. General. The water heater harness assembly (5, FO-3) (located in back of manual) consists of



1. Terminal (4) 2. Terminal (10)

Figure 6-17. Underfloor Heaters Power Harness Assembly (TS 013802)

electrical connector and seventeen electrical leads (fig. 6-18) to provide interconnection between the water system power harness and water box heaters.

b. Removal.

(1) Disconnect connector in the water box assembly.

(2) Remove the screws and washers used to secure thermo switch (19, FO-3) (located in back of manual) to the water box.

(3) Remove wiring harness electrical leads (20, FO-3) (located in back of manual) strip heaters and remove the harness.

c. Disassembly. Disassemble wiring harness as required for replacement of damaged parts as follows.

(1) Remove terminal (1, fig. 6-18).

(2) Remove adhesive from around electrical leads and unsolder wires from thermo switch (2) and remove switch.

(3) Disassemble strip heater assemblies to replace defective parts as follows.

(a) Disconnect wire (1, fig. 6-19) and remove nipples (2) from terminals.

(b) Remove nuts (3) and washers (4 and 5).

(c) Remove mounting screws (6), washers (7), and gaskets (8).

(d) Remove heater (9) and insulator (10) from the shelter.

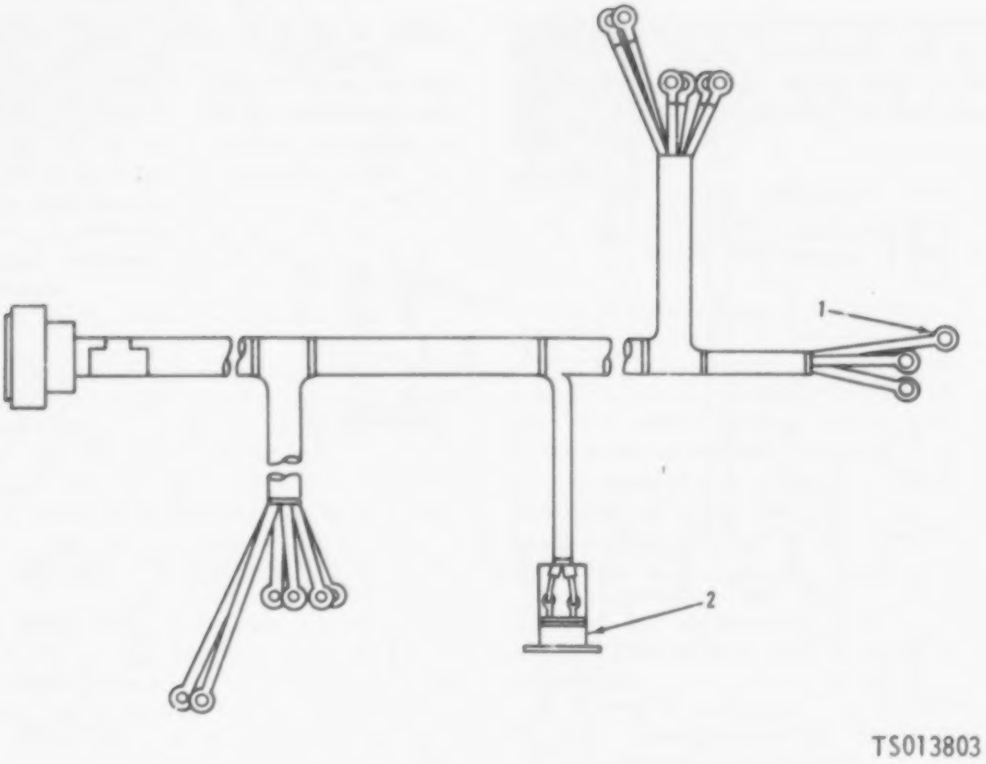
d. Assembly. Using figure 6-18 and FO-3 (located in back of manual) as a guide, assemble the wiring harness as follows:

(1) Install terminals (1, fig. 6-18) and crimp to secure.

(2) Solder wires to terminals on switch (2), according to Specification MIL-S-6872 using Sn60 solder that conforms to Specification QQ-S-571.

(3) Assemble strip heaters in reverse order of step c. (3) above and observing figure 6-19.

e. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must



1. Terminal (15)

2. Thermo switch

Figure 6-18. Water Box Heater Harness Assembly (TS 013803)

exist between connector pins or between connector pins and connector shell. If test indicates a defective connector or wire, replace harness assembly.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

g. Installation. Install wiring harness assembly as follows: (Use figure 6-19 as a guide for heater installation).

(1) Install wiring harness electrical leads (20, FO-3) (located in back of manual) strip heaters and install the harness.

(2) Install the screws and washers used to secure thermo-switch (19, FO-3) (located in back of manual) to the water box.

(3) Connect connector to the water box assembly.

6-14. Water Line Heaters Harness Assembly

a. General. The water box heater harness assembly (6, FO-3) (located in back of manual) consists of an electrical connector and twenty-nine electrical leads (fig. 6-20) to provide interconnection between the water system power harness and the water line heaters.

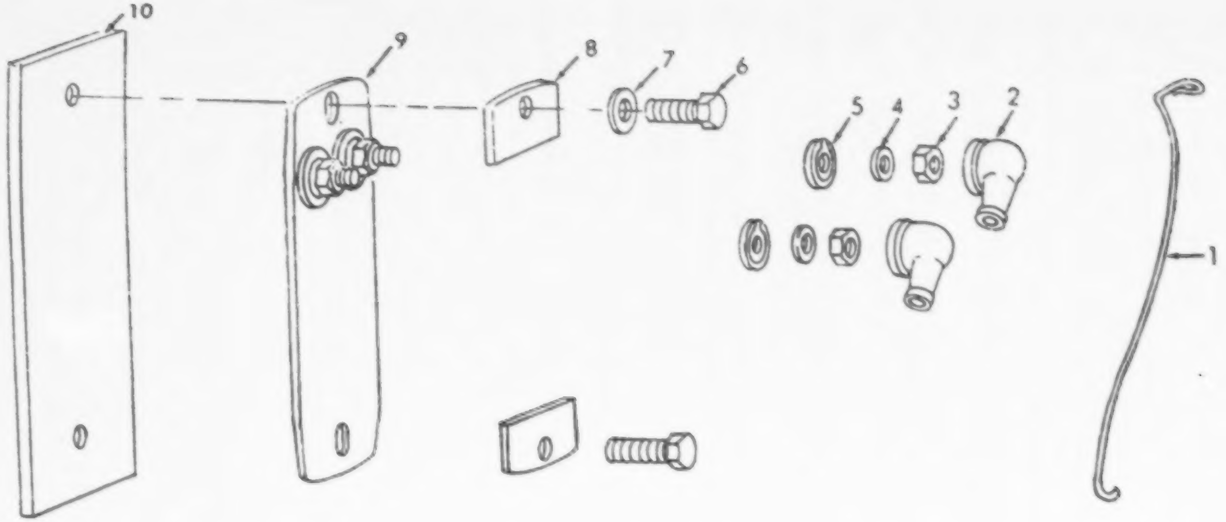
b. Removal.

(1) Jack up the expandable shelter to gain access to the water line tunnel under the shelter and remove the tunnel access panels (fig. 6-4).

(2) Remove clamps used to secure the wiring harness to the water line tunnel.

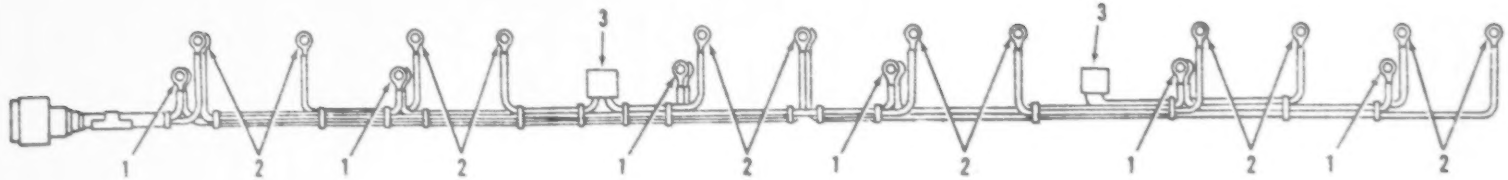
(3) Remove the screws and washers used to secure the thermo switches (3, fig. 6-20) to the water tunnel.

(4) Remove wiring harness terminals (1 and 2, fig. 6-20).


10
9
8
7
6
5
4
3
2
1
TS013804

1. Wire
2. Nipple
3. Nut
4. Washer
5. Washer
6. Screw
7. Washer
8. Gasket
9. Heater
10. Insulator

Figure 6-19. Heater Assemblies, Disassembly (TS 013804)


3
3
1
2
1
2
1
2
1
2
1
2
1
2
TS013805

1. Terminal (11)
2. Terminal (14)
3. Thermo switch

Figure 6-20. Water Line Heater Harness Assembly (TS 013805).

(5) Disconnect connector in the water box and remove the harness.

c. Disassembly. Disassemble wiring harness as required for replacement of damaged parts as follows.

(1) Remove terminals (1 and 2, fig. 6-20).

(2) Remove adhesive from electrical leads and unsolder wires from thermo switches (3).

(3) Remove the thermo switches (3).

(4) Remove terminal (1, fig. 6-18).

(5) Remove adhesive from around electrical leads and unsolder wires from thermo switch (2) and remove switch.

(6) Disassemble strip heater assemblies to replace defective parts as follows:

(a) Disconnect wire (1, fig. 6-19) and remove nipple (2) from terminals.

(b) Remove nuts (3) and washers (4 and 5).

(c) Remove mounting screws (6), washers (7), and gaskets (8).

(d) Remove heater (9) and insulator (10) from the shelter.

d. Assembly. Using figure 6-20 as a guide, assemble the wiring harness as follows:

(1) Install terminals (1 and 2, fig. 6-20) and crimp to secure.

(2) Solder wires to terminals on thermo switches (3) according to Specification MIL-S-6872 using Sn60 solder that conforms to Specification QQ-S-571.

e. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. If test indicates a defective connector or wire, replace harness.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

g. Installation. Install wiring harness assembly as follows:

(1) Connect connector to the water box and install the harness.

(2) Install wiring harness terminals (1 and 2, fig. 6-20).

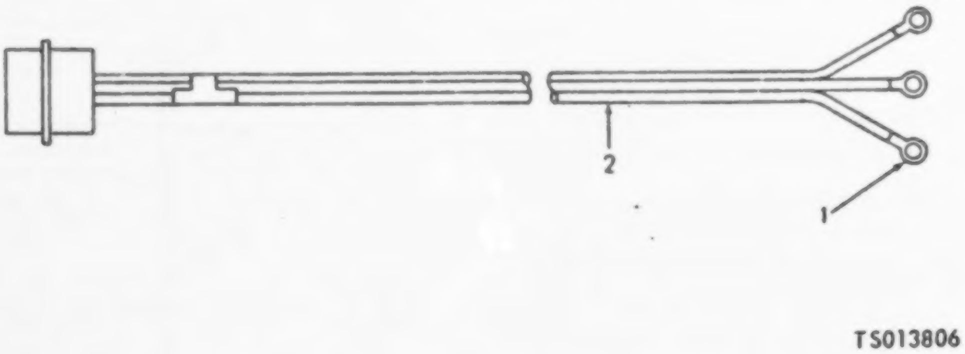
(3) Install the screws and washers used to secure the thermo switches (3, fig. 6-20) to the water tunnel.

(4) Install clamps used to secure the wiring harness to the water line tunnel.

(5) Jack up the expandable shelter to gain access to the water line tunnel under the shelter and install the tunnel access panels (fig. 6-4). Use figure 6-19 as a guide for heater installation.

6-15. Remote Temperature Sensing Harness Assembly

a. General. The remote temperature sensing harness assembly (4, FO-3) (located in back of manual) consists of a connector and three electrical leads (2, fig. 6-21) to provide interconnection between the shelter and a remote conditioned air source. This harness is installed on shelter No. 1 thru 184 only.



1. Terminal (3)
2. Leads (3)

Figure 6-21. Remote Temperature Sensor Harness Assembly (TS 013806)

b. Removal.

(1) Jack up the shelter to gain access to the electrical cable raceway under the shelter and remove the raceway access panels (fig. 6-4).

(2) Remove the clamps used to secure the wiring harness to the raceway.

(3) Disconnect electrical leads from terminals 1 through 3 on terminal board (68, fig. 6-7) in the power distribution box.

(4) Remove the nuts, washers and screws used to secure connector to the water box and remove the wiring harness.

c. Disassembly. Disassemble wiring harness as required for replacement of damaged parts by removing terminals (1, fig. 6-21) from electrical leads.

d. Assembly. Assemble wiring harness using figure 6-19 as a guide; install terminals (1) and crimp to secure.

e. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. If test indicates a defective connector or wire, replace harness assembly.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

g. Installation. Install wiring harness assembly as follows:

(1) Install the nuts, washers, and screws used to secure connector to the water box and install the wiring harness.

(2) Connect electrical leads to terminals 1 through 3 on terminal board (68, fig. 6-7, sheet 2 of 5) in the power distribution box.

(3) Install the clamps used to secure the wiring harness to the raceway.

(4) Jack up the shelter to gain access to the electrical cable raceway under the shelter and install the raceway access panels (fig. 6-4).

6-16. Humidifier Wiring Harness Assembly.

a. General. The humidifier wiring harness assembly (10, FO-3) (located in back of manual) consists of a connector and seven electrical leads (fig. 6-22) to provide interconnection between the power distribution box and a humidifier output receptacle.

b Removal.

(1) Remove electrical leads from terminal (38, fig. 6-7, sheet 2 of 5), terminal (28) and terminals (45) in the power distribution box.

(2) Remove screws securing cover (5, fig. 6-22) to receptacle box.

(3) Pull wiring harness from electrical raceway.

c. Disassembly. Disassemble wiring harness as required for replacement of damaged parts as follows.

(1) Remove terminals (1, fig. 6-22).

(2) Remove nuts (2), washers (3) and screws (4) used to secure cover (5) to connector (7) and remove cover (5).

(3) Slide insulation sleeving (6) back to expose soldered wire connections to connector (7). Unsolder connections and remove wires (8 and 9) from connector (7). Remove sleeving (6).

d. Assembly. Using figure 6-22 as a guide, assemble the humidifier wiring harness as follows:

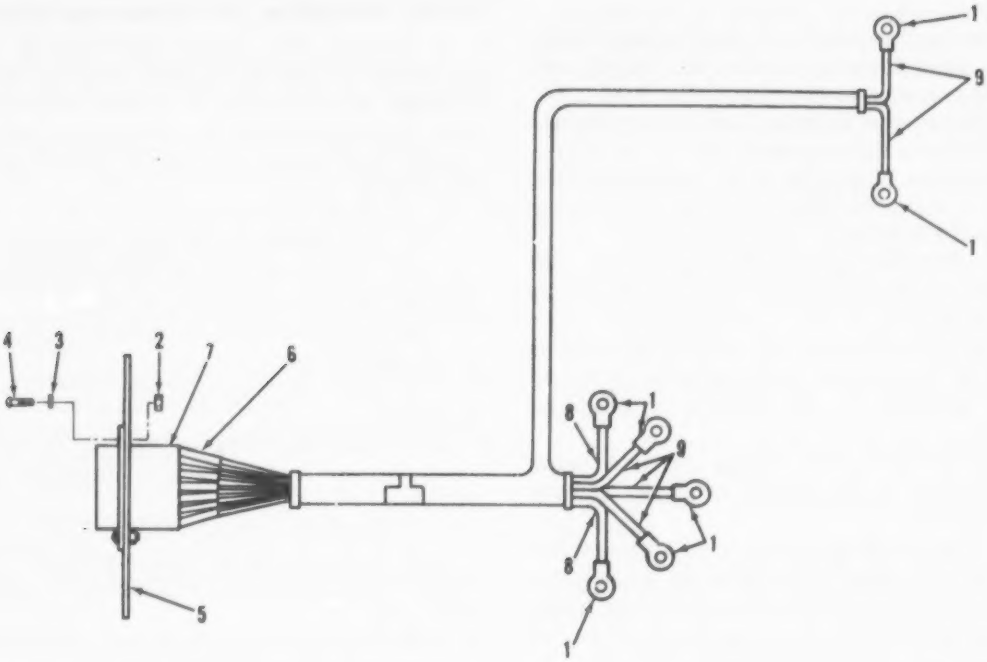
(1) Install insulation sleeving (6, fig. 6-22) over wires (8) and push back to expose connection end. Solder wires (8 and 9) to connector (7) according to Specification MIL-S-6872 using Sn60 solder that conforms to Specification QQ-S-571. Slide insulation sleeving (6) over soldered connection points.

(2) Install cover plate (5, fig. 6-22) on connector (7) and secure with screws (4), washers (3) and nuts (2).

(3) Install terminals (1) and crimp to secure.

e. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. Replace individual wires or connector if continuity does not exist.

f. Repair. If possible, straighten any bent connector pins. Inspect wires and insulation sleeves for abrasions and cuts. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace if cut or otherwise damaged. Bent or damaged cover (5, fig. 6-22) shall be repaired, if possible, by straightening, using a padded vise, hammer or other suitable tool.



TS013807

1. Terminal (7)
2. Nut (4)
3. Washer (8)
4. Screw (4)
5. Cover plate
6. Sleeving, insulation
7. Connector
8. Wire
9. Wire

Figure 6-22. Humidifier Wiring Harness Assembly (TS 013807)

NOTE

Cuts or abrasions of harness assemblies may be due to sharp edges of electrical raceways, interference with other components or improper handling. The cause shall be determined and eliminated before installation of the harness assemblies.

g. Installation. Install humidifier wiring harness as follows:

(1) Install wiring harness to electrical raceway.

(2) Install screws to secure cover (5, fig. 6-22) to receptacle box.

(3) Install electrical leads to terminal (38, fig. 6-7, sheet 2 of 5), terminal (28) and terminal (45) in the power distribution box.

Section III. LIGHT ASSEMBLIES AND CONVENIENCE RECEPTACLES

6-17. General

This section contains the light assemblies used for illumination in the shelter and air lock chamber and the convenience receptacles used for connection of electrical appliances along the shelter walls and ceiling. They consist of an air lock chamber light assembly, six fluorescent light assemblies and twelve convenience receptacles.

6-18. Air Lock Light Assembly

a. General. The air lock light assembly provides illumination in the air lock chamber. The light assembly consists of a junction box, lamp socket, incandescent lamp and a wiring harness.

b. Removal. Remove air lock light assembly, by disconnecting cable assembly from light assembly, from air lock light receptacle on power inlet or outlet panel and remove light assembly from hook in air lock chamber.

c. Air Lock Light Assembly Test. Check continuity of light assembly using a continuity light, multimeter (para 11-2) or other continuity checking device.

d. Repair. Inspect individual exposed wires and cable insulation for cuts and abrasions. Repair minor cuts and abrasions to cable and wires by wrapping with electrician's vinyl tape or Mylar tape. Inspect mounting bracket (15, fig. 6-23) for damage and misalignment. If possible, straighten bracket (15) by means of a vise, pliers or hammer. Painted components of the light assembly shall be repainted, as required, by sanding, applying primer and painting with paint conforming to Federal Standard 595, Color Chip 34087. If continuity does not exist through light or cable assembly, replace cable (22) or socket assembly (12).

e. Disassembly. Disassemble light assembly as required for replacement of damaged or malfunctioning components according to sequence of index numbers assigned to figure 6-23 and observing the following.

(1) Remove lamp (1) and place in a protected area to prevent breakage.

(2) Remove screws (2), washer (3) and guard (4).

(3) Remove screws (5 and 7), washer (6), cover (8) and gasket (9).

(4) Loosen knurled nut on connector (18) to permit pulling cable (22) through connector. Pull assembled socket (12), bracket (15) and leads of cable (22) out of junction box (20) far enough to permit access to screws (10 and 13).

(5) Remove screws (10 and 13) and washer (14). Separate terminals (16 and 17) and bracket (15) from socket (12).

NOTE

Tag or otherwise identify electrical leads as to connection point for aid at assembly.

(6) Pull cable (22) through connector (18). Remove connector (18) from junction box (20).

(7) If required for replacement, remove terminals (16 and 17) from leads of cable (22).

f. Assembly. Using figure 6-23 as a guide, assemble the light assembly as follows:

(1) Install terminals (17, fig. 6-23) on white and black leads of cable (22) and crimp to secure. Install terminals (16) on green lead of cable (22) and crimp to secure.

(2) Install connector (18) on cable (22) and insert electrical leads of cable (22) into junction box (20). Position bracket (15) on socket (12) and secure with screw (10), washer (14) and terminal on green electrical lead. Install terminals on black and white electrical leads on socket (12) and secure with screws (13).

(3) Pull cable (22) back through connector (18) and position assembled bracket (15) and socket (12) in junction box (20). Secure bracket (15) to junction box (20) with gasket (9), cover (8) and screws (5).

(4) Install guard (4) and secure with screws (2) and washers (3).

(5) Install lamp (1).

g. Installation. Install air lock light assembly, by connecting cable assembly to light assembly, to air lock light receptacle on power inlet or outlet panel and install light assembly to hook in air lock chamber.

6-19. Electrical Convenience Receptacles

a. General. The twelve convenience receptacles connected to the shelter wire assemblies provide for connection of appliances and accessories within the expandable shelter. The receptacles consist of a duplex receptacle installed in a housing.

b. Removal.

(1) Remove screw (1, fig. 6-24) securing the receptacle cover plate (2) to the receptacle.

(2) Remove screws (3) securing the receptacles (4) to the receptacle housing.

(3) Disconnect electrical leads and jumper wire (5) from the receptacle (4) and remove receptacle from housing.

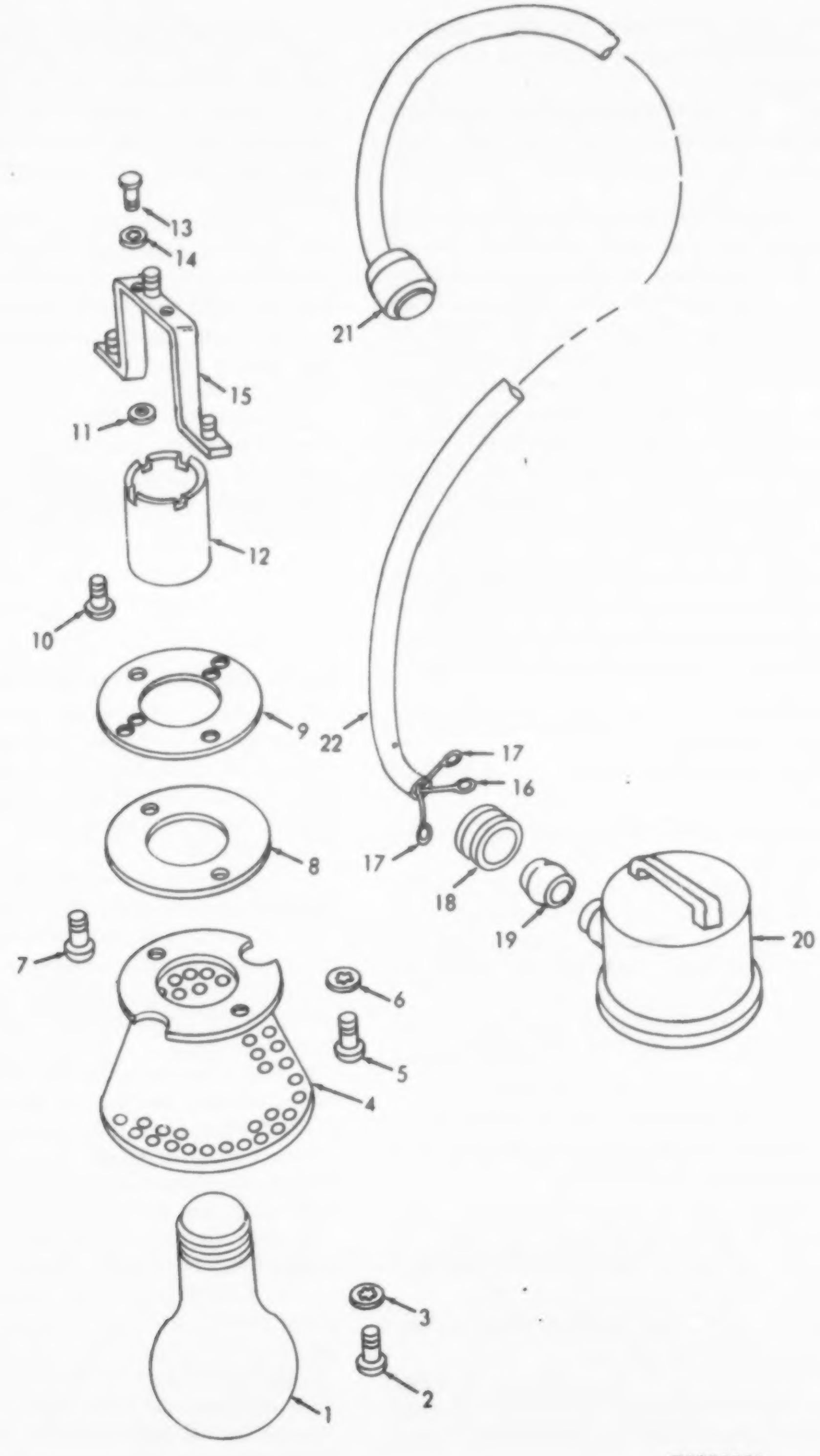
c. Test. Check continuity of convenience receptacles using a continuity light, multimeter (para 11-2) or other continuity checking device. Continuity must exist through receptacle outlets and terminals. Replace receptacle if continuity does not exist or if any evidence of shorting is present.

d. Installation. Using figure 6-24 as a guide, install receptacle as follows:

(1) Connect electrical leads and jumper wire (5) to the receptacle (4) and install receptacle to housing.

(2) Install screws (3) to secure the receptacles (4) to the receptacle housing.

(3) Install screw (1, fig. 6-24) to secure the receptacle cover plate (2) to the receptacle.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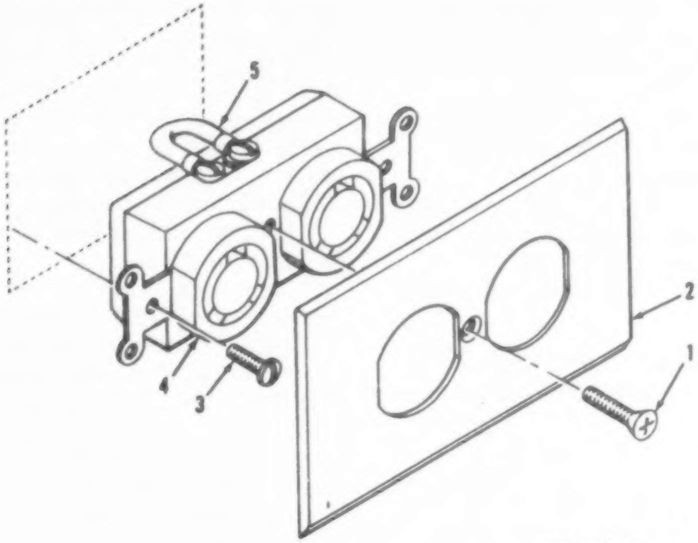
3
2
1

TS013808

Figure 6-23. Air Lock Light Assembly, Disassembly (TS 013808)

1. Incandescent lamp
2. Screw (4)
3. Washer (4)
4. Air lock light guard
5. Screw (2)
6. Washer
7. Screw
8. Junction box cover
9. Receptacle gasket
10. Screw
11. Washer
12. Socket
13. Screw
14. Washer
15. Bracket
16. Terminal
17. Terminals
18. Connector
19. Bushing
20. Junction box
21. Connector
22. Cable

Figure 6-23 — Continued.



1. Screw (1)
2. Cover plate
3. Screw (2)
4. Convenience receptacle
5. Jumper wire

Figure 6-24. Electrical Convenience Receptacles, Disassembly (TS 013809)

Section IV. POWER DISTRIBUTION BOX ASSEMBLY REPAIR INSTRUCTIONS

6-20. General

This section contains the power distribution box assembly used for the distribution and control of electrical power within the shelter. The distribution box assembly consists of nine wiring harness assemblies, seven wire and terminal assemblies, nineteen circuit breakers, six receptacles, three toggle switches, and emergency light and six terminal boards enclosed in a metal distribution box assembly.

NOTE

Tag or otherwise identify all electrical leads as to connection point as soon as removed for aid at assembly. All soldering of electrical connections should be accomplished according to Specification MIL-S-6872 using Sn60 solder which conforms to Specification QQ-S-571.

6-21. 60 Hertz Wiring Harness Assembly

a. General. The 60 Hertz wiring harness provides 60 Hertz power between terminal board and electrical components of the power distribution box. The 60 Hertz wiring harness provides 60 Hertz power between terminal board and electrical components of the power distribution box. The 60 Hertz wiring harness consists of electrical wires terminating at 18 terminal lugs. Refer to figure 6-7.

b. Removal. Remove 60 Hertz wiring harness assembly (19, fig. 6-7, sheet 1 of 5) as required to replace damaged or defective components as follows.

(1) Open circuit breaker panel assembly cover (125, fig. 6-7 sheet 5 of 5).

(2) Remove screws which secure circuit breaker panel (123) to distribution box (124) and fold back exposing interior of distribution box.

(3) Remove terminal board cover (57, fig. 6-7, sheet 2 of 5) and nuts (53), lockwashers (54) and washers (55) to disconnect electrical leads from terminals on terminal board (60).

(4) Remove screws (17, fig. 6-7, sheet 1 of 5) and disconnect electrical leads from circuit breakers (104 and 122, fig. 6-7, sheet 5 of 5).

(5) Remove 60 Hertz wiring harness assembly (19).

c. Disassembly. Disassemble 60 Hertz wiring harness as required to replace damaged parts as follows (fig. 6-25).

(1) Remove terminals (1, 2, 3 and 4).

(2) Remove tie straps (5), identification strap (6) and remove damaged or defective wires.

d. Assembly. Using figure 6-25 as a guide, assemble the 60 Hertz wiring harness as follows:

(1) Replace wires and straps.

(2) Install terminals (1, 2, 3 and 4, fig. 6-25) and crimp to secure.

e. Test. Check continuity of wiring harness using a continuity light, multimeter (para 11-2) or other continuity checking device. Continuity must exist between wire ends. Replace applicable wire if continuity does not exist between wire ends.

f. Repair. Repair 60 Hertz wiring harness assembly to return to a serviceable condition as follows.

(1) Inspect individual wires for cuts and abrasions of insulation. Minor cuts and abrasions are acceptable and shall be repaired by wrapping damaged area with vinyl tape or other suitable electrical wiring tape.

(2) Inspect tie straps (5, fig. 6-25) for tightness and fraying. Replace any loose or frayed tie straps.

g. Installation. Using figure 6-7 as a guide, install the 60 Hertz wiring harness as follows:

(1) Position harness assembly (19, fig. 6-7, sheet 1 of 5) in distribution box and install applicable electrical leads on terminals 1, 2, 3 and 4 respectively of terminal board (60, fig. 6-7, sheet 2 of 5). Install applicable electircal leads on applicable circuit breakers.

(2) Install terminal board cover (57, fig. 6-7, sheet 2 of 5) on terminal board (60).

(3) Place circuit breaker panel (123, fig. 6-7, sheet 5 of 5) in position and secure with screws.

6-22. 400 Hertz Wiring Harness Assembly

a. General. The 400 Hertz wiring harness provides 400 Hertz power between four terminal boards and electrical components of the power distribution box. The 400 Hertz wiring harness consists of electircal wires terminating at 46 terminal lugs. Refer to figures 6-7 and 6-26.

b. Removal. Remove 400 Hertz wiring harness assembly (18, fig. 6-7, sheet 1 of 5) according to sequence of index numbers assigned to figure 6-7 and observing the following.

(1) Open circuit breaker panel cover (125, fig. 6-7, sheet 5 of 5).

(2) Remove screws which secure circuit breaker panel (123) to distribution box (124) and fold back exposing interior of distribution box.

(3) Remove terminal board covers (49 and 57, fig. 6-7, sheet 2 of 5) and remove nuts (53), lockwashers (54) and washers (55) to disconnect electrical leads from terminals 1, 2, 3, 4 and 5 on terminal board (52) and terminal 5 on board (60). Remove terminal board covers (25 and 35) from terminal baords (38) and (28) and remove nut (29), lockwasher (30) and washer (31) to disconnect terminal on baord (28 and 38).

(4) Remove screws to disconnect electrical leads from circuit breakers (101, 110, 113, 116, and 122, fig. 6-7, sheet 5 of 5).

(5) Remove 400 Hertz wiring harness (18, fig. 6-7, sheet 1 of 5) from distribution box.

c. Disassembly. Disassemble 400 Hertz wiring harness as required to replace damaged parts as follows (fig. 6-26).

(1) Remove terminals (1 through 8).

(2) Remove identification strap (9) and tie straps (10) from harness assembly.

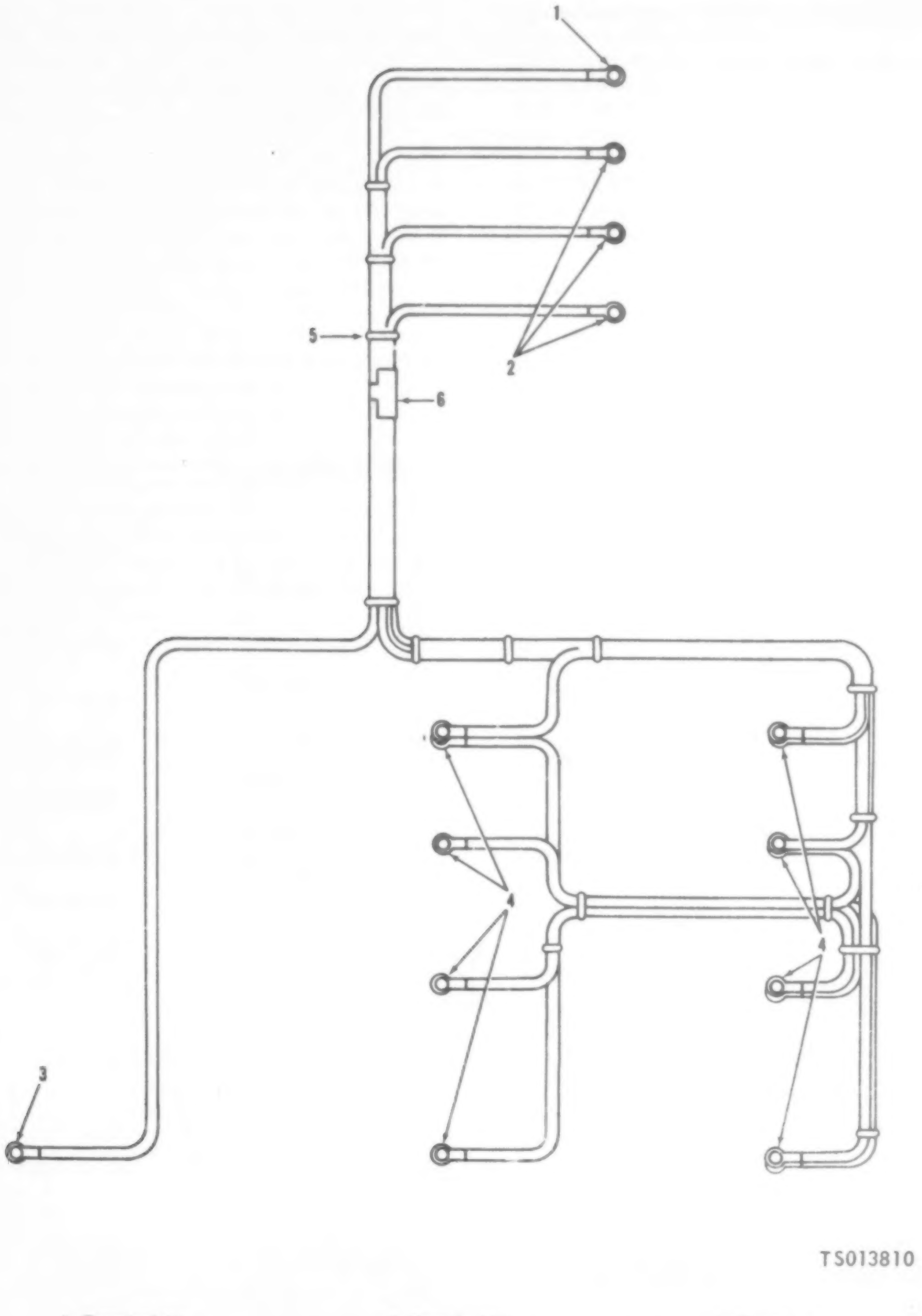
(3) Remove any damaged or defective electrical leads.

d. Assembly. Using figure 6-26 as a guide, assemble the 400 Hertz wiring harness as follows:

(1) Install new wires, if required, and secure with tie straps (9, fig. 6-26).

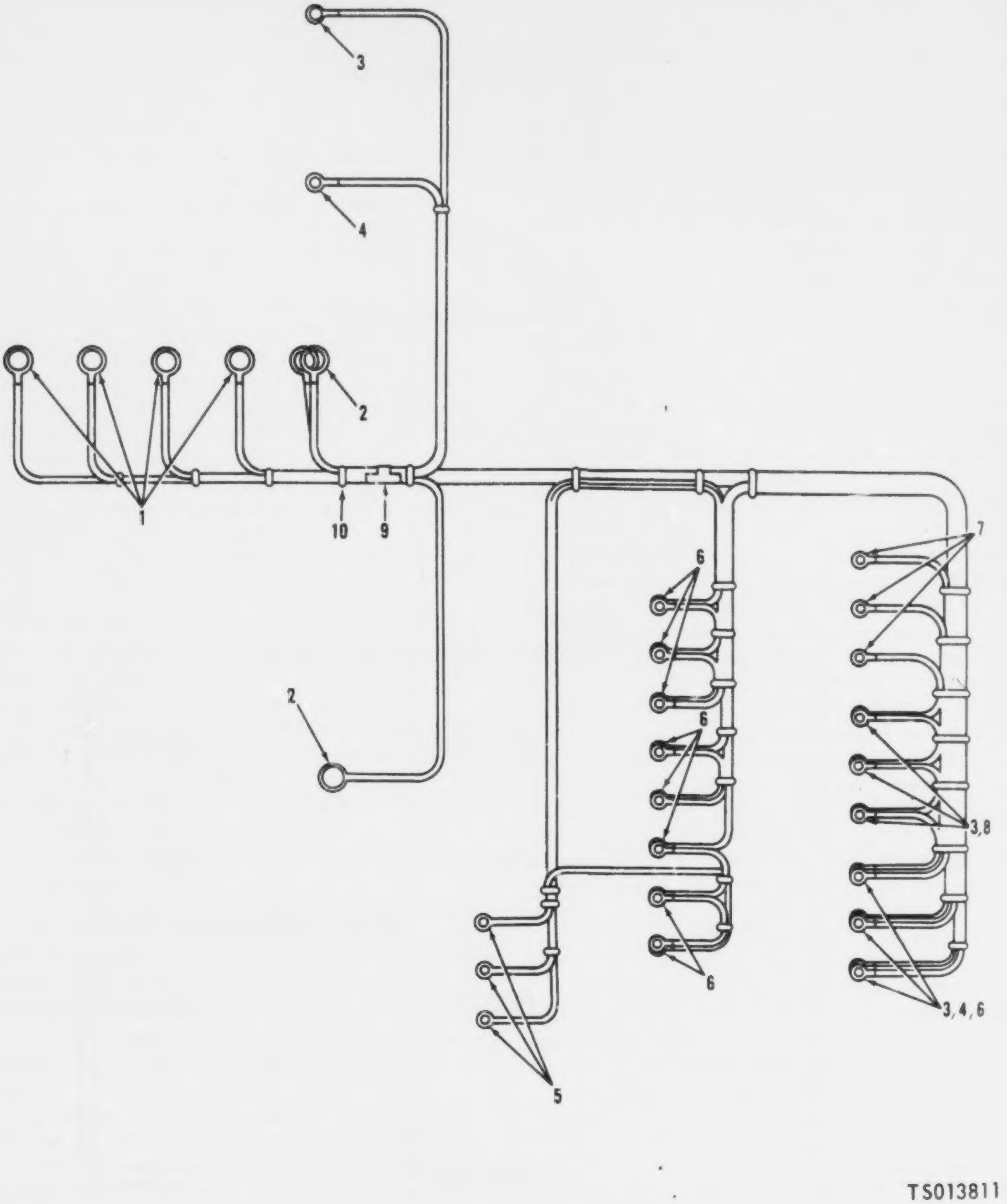
(2) Install terminals (1 through 8) and crimp to secure.

e. Test. Check continuity of wiring harness using a continuity light, multimeter (para 11-2), or other


1
2
5
6
3
4
4
TS013810

1. Terminal (1)
2. Terminal (3)
3. Terminal (1)
4. Terminal (13)
5. Tie straps
6. Identification strap

Figure 6-25. 60 Hertz Wiring Harness Assembly (TS 013810)


3
4
1
2
10
9
2
6
6
6
7
3,8
3,4,6
5
TS013811

1. Terminal (4)
2. Terminal (3)
3. Terminal (7)
4. Terminal (4)
5. Terminal (3)
6. Terminal (19)
7. Terminal (3)
8. Terminal (3)
9. Identification strap
10. Tie strap

Figure 6-26. 400 Hertz Wiring Harness Assembly (TS 013811) continuity checking device. Continuity must exist between wire ends. Replace wire if continuity does not exist between wire ends.

f. Repair. Repair 400 Hertz wiring harness assembly to return to a serviceable condition as follows.

(1) Inspect individual wires for cuts and abrasions of insulation. Minor cuts and abrasions are acceptable and shall be repaired by wrapping damaged area with vinyl tape or other suitable electrical wiring tape. Replace any individual wires which are cut through or otherwise damaged.

(2) Inspect tie straps (10, fig. 6-26) for tightness and fraying. Replace any loose or frayed tie straps.

g. Installation. Install 400 Hertz wiring harness in reverse order of removal using figure 6-7 as a guide, and observing the following:

(1) Position harness assembly (18, fig. 6-7, sheet 1 of 5) in distribution box and install electrical leads.

(2) Replace washers (55, and 31, fig. 6-7, sheet 2 of 5), lockwashers (54 and 30) and nuts (53 and 29) on terminals of terminal boards (28, 38, 52 and 60) and tighten nuts securely. Replace terminal board covers (25, 35, 49 and 57).

(3) Place circuit breaker panel in position and secure with screws.

6-23. Sterilizer Wiring Harness Assemblies

a. General. The sterilizer wiring harness assemblies consist of a connector and four electrical leads to provide interconnection between the electrical system and two sterilizers, when used.

b. Removal. Remove sterilizer harness assemblies (5 and 6, fig. 6-7, sheet 1 of 5) according to sequence of index numbers assigned to figure 6-7 and observing the following:

(1) Open circuit breaker panel cover (125, fig. 6-7, sheet 5 of 5).

(2) Remove circuit breaker panel per paragraph 6-21*b*(2).

(3) Remove terminal board cover (35, fig. 6-7, sheet 2 of 5) and remove nut (29), lockwasher (30) and washer (31) from terminal 5 on terminal board (38) for the harness assembly (5, fig. 6-7, sheet 1 of 5) and terminal 4 for the harness assembly (6) and remove the electrical leads from the terminal boards.

(4) Remove nuts (1), washers (2) and screws (3) and remove harness assemblies (5 and 6) from distribution box. Remove cover (4).

(5) Remove screws to disconnect the harness electrical leads from circuit breakers (101, fig. 6-7, sheet 5 of 5) for the sterilizer harness (5 and 6, fig. 6-7, sheet 1 of 5).

(6) Remove the harness assemblies (5 and 6) from the distribution box.

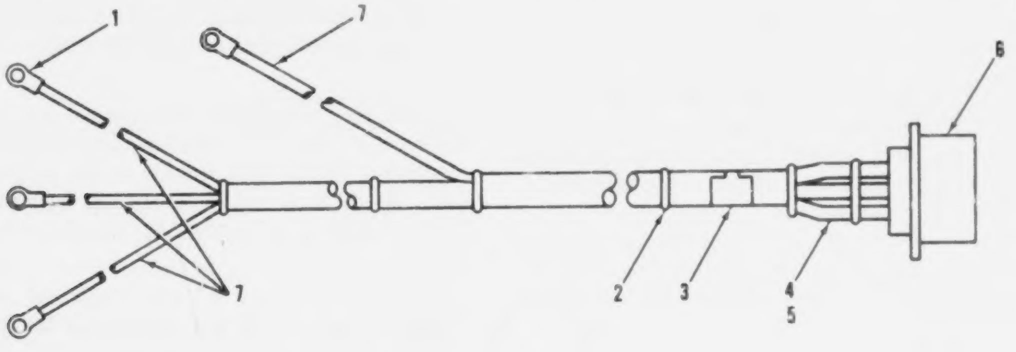
c. Disassembly. Disassemble the sterilizer harness assemblies as required to replace damaged parts as follows (fig. 6-27).

(1) Remove terminals (1, fig. 6-27).

(2) Remove cable straps (2) and identification strap (3).

(3) Slide back insulation sleeving (4 and 5) to expose solder connections at connector (6) and unsolder electrical wires (7) from connector (6). Remove sleeving (4 and 5).

d. Assembly. Using figure 6-27 as a guide, assemble the sterilizer harness assemblies as follows:



1. Terminal (8, 4 per ay)
2. Strap, cable
3. Strap, identification
4. Sleeving (2, 1 per ay)
5. Sleeving (6, 3 per ay)
6. Connector (2)
7. Wire

Figure 6-27. Sterilizer Wiring Harness Assembly (TS 013812)

(1) Place insulation sleeving (4 and 5) over wires (7) and slide back to expose solder connections.

(2) Solder wires (7) to connectors in accordance with Specification MIL-S-6872 using Sn60 solder which conforms to Specification QQ-S-571.

(3) Replace cable straps (2) and identification strap (3).

(4) Install terminals (1) and crimp to secure.

e. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. Replace any faulty wires or connectors as indicated during continuity test.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace individual wires if cut or otherwise damaged.

g. Installation. Install the sterilizer harness assemblies, using figure 6-7 as a guide and observe the following:

(1) Position harness assemblies (5 and 6, fig. 6-7, sheet 1 of 5) in distribution box and install electrical leads.

(2) Replace washers (31), lockwashers (30) and nuts (29) on terminals 4 and 5 of terminal board (38) and tighten securely. Replace terminal board cover (35).

(3) Position connectors (6, fig. 6-27) in mounting holes and secure with screws (3, fig. 6-7, sheet 1 of 5), washers (2) and nuts (1).

(4) Position circuit breaker panel (123) on distribution box (124) and secure with screws.

6-24. X-Ray Wiring Harness Assembly

a. General. The X-ray wiring harness assembly consists of a connector and four electrical leads to provide interconnection between the electrical system and an X-ray unit.

b. Removal. Remove X-ray wiring harness assembly (11, fig. 6-7, sheet 1 of 5) according to sequence of index numbers assigned to figure 6-7, and observing the following.

(1) Open circuit breaker panel cover.

(2) Remove circuit breaker panel per paragraph 6-21*b*.(2).

(3) Remove terminal board cover (25, fig. 6-7, sheet 2 of 5) and remove nut (29), lockwasher (30) and terminal 5 on terminal board (28). Remove the electrical lead.

(4) Remove screws and disconnect electrical leads from circuit breaker (101, fig. 6-7, sheet 5 of 5).

(5) Remove nuts (7, fig. 6-7, sheet 1 of 5), washers (8) and screws (9) and remove connector (11) from the distribution box.

(6) Remove the X-ray harness assembly (11) from the distribution box.

c. Disassembly. Disassemble the X-ray harness assembly (11, fig. 6-7, sheet 1 of 5) as required to replace damaged parts as follows (fig. 6-28).

(1) Remove terminals (1 and 2, fig. 6-28).

(2) Remove identification strap (3).

(3) Slide back insulation sleeving (4 and 5) to expose soldered wire connectors to connector (6). Unsolder connections and remove wires (7 and 8) from connector (6). Remove sleeving (4 and 5).

d. Assembly. Assemble X-ray harness assembly using figure 6-28 as a guide and observing the following:

(1) Place insulation sleeving (4 and 5, fig. 6-28) over wires (7 and 8) and slide back to expose solder connections.

(2) Solder wires (7 and 8) to connector (6) in accordance with Specification MIL-S-6872 using Sn60 solder which conforms to Specification QQ-S-571.

(3) Replace identification strap (3).

(4) Install terminals (1 and 2) and crimp to secure.

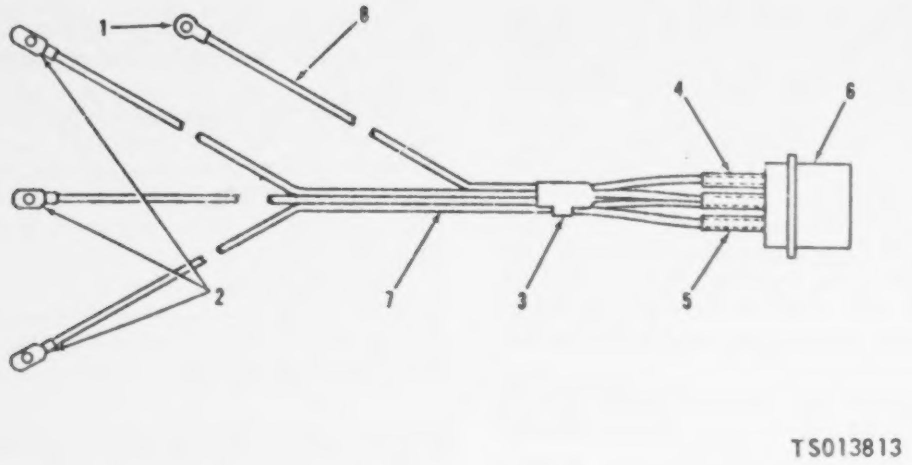
e. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. Replace defective components, as required, if indicated by continuity test.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace individual wires if cut or otherwise damaged.

g. Installation. Install the X-ray harness using figure 6-7 as a guide and observing the following:

(1) Position harness assembly (11, fig. 6-7, sheet 1 of 5) in distribution box and install electrical leads.

(2) Replace washers (31, fig. 6-7, sheet 2 of 5), lockwasher (30) and nut (29) on terminal 5 of terminal board (28). Replace terminal board cover (25).



1. Terminal (1)
2. Terminal (3)
3. Strap, identification
4. Sleeving (1)
5. Sleeving (3)
6. Connector
7. Wire
8. Wire

Figure 6-28. X-ray Wiring Harness Assembly (TS 013813)

(3) Position connector in mounting hole and secure with screw (9, fig. 6-7, sheet 1 of 5), washer (8) and nut (7).

(4) Position circuit breaker panel (123, fig. 6-7, sheet 5 of 5) on distribution box (124) and secure.

6-25. Water Line Heater Harness Assembly

a. General. The water line heater harness' assembly consists of a relay and seven electrical leads to provide interconnection between the power distribution box and the water line heater power harness.

b. Removal. Remove water line heater harness (23, fig. 6-7, sheet 2 of 5) according to sequence of index numbers assigned to figure 6-7 and observing the following:

(1) Open circuit breaker panel cover.

(2) Remove circuit breaker panel per paragraph 6-21*b*.(2).

(3) Remove terminal board cover (42, fig. 6-7, sheet 2 of 5) and remove nut (46), lockwasher (47) and washer (48) from terminals 7 through 10 on terminal board (45). Remove the electrical leads.

(4) Remove screws (17, fig. 6-7, sheet 1 of 5) and disconnect electrical leads from circuit breaker (110, fig. 6-7, sheet 5 of 5).

(5) Remove nut (20, fig. 6-7, sheet 2 of 5), washer (21) and screw (22) used to secure relay to mounting bracket. Remove harness (23) from distribution box.

c. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Replace harness assembly if continuity does not exist or relay is defective.

d. Repair. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged or relay is damaged or defective.

e. Installation. Install the water line heater harness assembly (23, fig. 6-7, sheet 2 of 5) using figure 6-7 as a guide, observing the following:

(1) Position harness assembly (23, fig. 6-7, sheet 2 of 5) in distribution box and install electrical leads.

(2) Replace washers (48), lockwashers (47) and nuts (46) on terminals 7 through 10 on terminal board (45). Replace terminal board cover (42).

(3) Position water line heater assembly relay (23) on mounting bracket and secure with screw (22), washer (21) and nut (20).

(4) Position circuit breaker panel (123, fig. 6-7, sheet 5 of 5) on distribution box (124) and secure with screws.

6-26. Humidifier Harness Assembly

a. General. The humidifier harness assembly consists of an electrical connector and relay and ten electrical leads to provide for interconnection of the humidifier components and the electrical system.

b. Removal. Remove humidifier harness (16, fig. 6-7, sheet 1 of 5) according to sequence of index numbers assigned to figure 6-7 and observing the following.

(1) Open circuit breaker panel cover.

(2) Remove circuit breaker panel per paragraph 6-21*b*.(2).

(3) Remove terminal board cover (42, fig. 6-7, sheet 2 of 5) and remove nut (46), lockwasher (47) and washer (48) from terminals 3 through 6 on terminal board (45). Remove the electrical leads. Remove electrical lead from terminal 2 on terminal board (38).

(4) Remove screws (17, fig. 6-6, sheet 1 of 5) and disconnect electrical leads from circuit breaker (107, fig. 6-7, sheet 5 of 5).

(5) Remove nut (20, fig. 6-7, sheet 2 of 5), washer (21) and screw (22) used to secure relay (24) to mounting bracket.

(6) Remove nut (12, fig. 6-7, sheet 1 of 5), washer (13) and screw (14) used to secure humidifier harness (16) (humidistat receptacle) to distribution box. Remove receptacle cover (15).

(7) Remove the humidifier harness assembly (16) from the distribution box.

c. Test. Use a continuity light, multimeter (para 11-2) or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Replace harness assembly if continuity does not exist or relay is defective.

d. Repair. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged or relay is damaged or defective.

e. Installation. Install the humidifier harness assembly (16, fig. 6-7, sheet 1 of 5) using figure 6-7 as a guide and observing the following:

(1) Position harness assembly (16, fig. 6-7, sheet 1 of 5) in distribution box and install electrical leads.

(2) Replace washers (48, fig. 6-7, sheet 2 of 5), lockwashers (47) and nuts (46) on terminals 3 through 6 on terminal board (45), and terminal 2 on terminal board (38). Replace terminal board cover (42) on terminal board (45) and terminal board cover (35) on terminal board (38).

(3) Position relay (24) on mounting bracket and secure with screw (22), washer (21) and nut (20).

(4) Position circuit breaker panel (123, fig. 6-7, sheet 5 of 5) on distribution box (124) and secure.

6-27. Remote Temperature Sensing Harness Assembly

a. General. The remote temperature sensing harness consists of a connector and three electrical leads (2, fig. 6-29) to provide interconnection between the electrical system and a remote temperature probe. **This harness is installed on shelter No. 1 thru 184 only.**

b. Removal. Remove remote temperature harness assembly (72, fig. 6-7, sheet 2 of 5) according to sequence of index numbers assigned to figure 6-7 and observing the following:

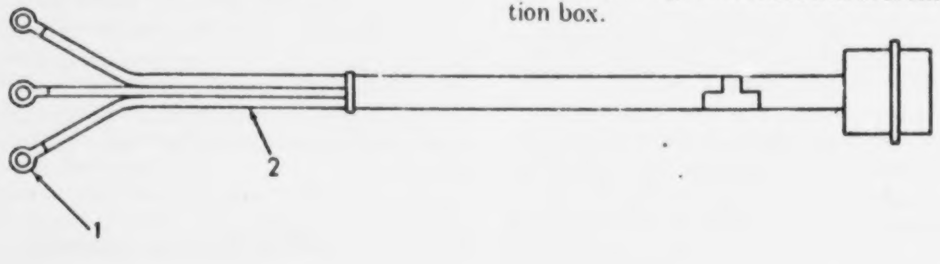
(1) Open circuit breaker panel cover.

(2) Remove circuit breaker panel per paragraph 6-21*b*(2).

(3) Remove terminal baord cover (65, fig. 6-7, sheet 2 of 5) and remove nut (69), lockwasher (70) and washer (71) from terminals 1 through 3 on terminal board (68). Remove the electrical leads.

(4) Remove nuts (80, fig. 6-7, sheet 3 of 5), washer (81) and screws (82) to remove connector (84) from the distribution box. Remove connector cover (83) from connector.

(5) Remove the remote temperature sensing harness (72, fig. 6-7, sheet 2 of 5) from the distribution box.



1. Terminal (3)
2. Electrical leads (3)

Figure 6-29. Remote Temperature Wiring Harness (TS 013814)

c. Disassembly. Disassemble the remote temperature sensing harness to replace damaged parts by removing terminals (1, fig. 6-29).

d. Assembly. Assemble harness assembly using figure 6-29 as a guide and observing the following:

(1) Install terminals (1, fig. 6-29).

(2) Crimp to secure.

e. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check continuity of wiring. Continuity must exist between end fittings on individual wires. Continuity must not exist between connector pins or between connector pins and connector shell. Replace harness assembly if continuity tests indicates defective wires or connection.

f. Repair. If possible, straighten any bent connector pins. Inspect wires for abrasions and cuts of insulation. Minor cuts and abrasions are acceptable and may be repaired by wrapping with vinyl tape. Replace harness assembly if individual wires are cut or otherwise damaged.

g. Installation. Install the remote temperature sensing harness using figure 6-7 as a guide and observing the following:

(1) Position harness assembly (72, fig. 6-7, sheet 2 of 5) in distribution box and install electrical leads.

(2) Replace washers (71), lockwashers (70), and nuts (69) on terminals 1 through 3 of terminal board (68). Replace terminal board cover (65) on terminal board (68).

(3) Position connector (84, fig. 6-7, sheet 3 of 5) into mounting hole on distribution box and secure with screws (82), washers (81), and nuts (80).

(4) Place circuit breaker panel in position on distribution box and secure with screws.

6-28. Wire and Terminal Assemblies

a. General. The wire and terminal assemblies provide for interconnection of the power distribution box electrical system. The wire and terminal assemblies consist of a single wire with a terminal lug on each end.

b. Removal. Remove loose wires according to sequence of index numbers assigned to figure 6-7 and observing the following.

(1) Open circuit breaker panel cover door.

(2) Remove screw to disconnect electrical wire (88, fig. 6-7, sheet 3 of 5) from terminal 2 on circuit breaker (107, fig. 6-7, sheet 5 of 5). Disconnect other end of wire from terminal 2 toggle switch (85, fig. 6-7, sheet 3 of 5).

(3) Disconnect wires (86 and 87) from toggle switches (85).

(4) Disconnect wires from terminals 1, 3 and 5 of circuit breaker (101, fig. 6-7, sheet 5 of 5). Disconnect other end of wires from terminals 2, 3, and 4 on terminal board (60, fig. 6-7, sheet 2 of 5).

(5) Disconnect wire from terminal 2 of circuit breaker (122, fig. 6-7, sheet 5 of 5). Remove other end of wire from terminal 2 of lamp (79, fig. 6-7, sheet 3 of 5).

c. Disassembly. Disassemble wire assemblies as required to replace damaged components by removing terminals (1, 2 3 or 4, fig. 6-30).

d. Assembly. Assemble wire assemblies using figure 6-30 as a guide and observing the following:

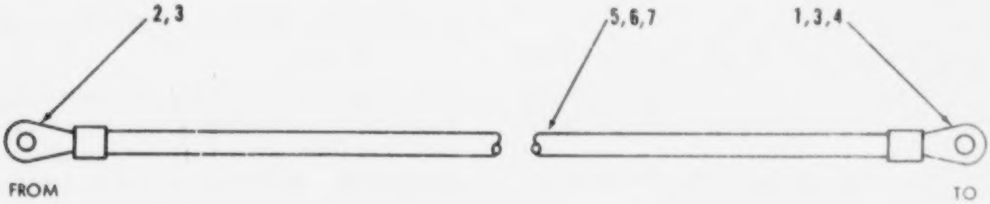
(1) Install terminals (1 through 4).

(2) Crimp to secure.

e. Test. Use a continuity light, multimeter (para 11-2), or other continuity checking device to check continuity of wires. Continuity must exist between fittings on wires.

f. Installation. Install wire and terminal assemblies as follows:

(1) Install other end of wire to terminal 2 of lamp (79, fig. 6-7, sheet 3 of 5). Connector wire to terminal 2 of circuit breaker (122, fig. 6-7, sheet 5 of 5).



TS 013815

1. Terminal (3)
2. Terminal (3)
3. Terminal (6)
4. Terminal (2)
5. Wire
6. Wire
7. Wire

Figure 6-30. Wire and Terminal Assemblies (TS 013815)

(2) Connect other end of wires to terminals 2, 3 and 4 on terminal board (60, fig. 6-7, sheet 2 of 5). Connect wires to terminals 1, 3 and 5 of circuit breaker (101, fig. 6-7, sheet 5 of 5).

(3) Connect wires (86 and 87, fig. 6-7, sheet 3 of 5) to toggle switches (85).

(4) Connect other end of wire to terminal 2 toggle switch (85). Install screw to connect electrical wire (88, fig. 6-7, sheet 3 of 5) to terminal 2 on circuit breaker (107, fig. 6-7, sheet 5 of 5).

(5) Close circuit breaker panel cover door.

6-29. Distribution Box Assembly

a. General. The distribution box assembly is a metal structure used to house the electrical components of the power distribution electrical system (fig. 6-7).

b. Removal. Remove the distribution box assembly using figure 6-7) as a guide and observing the following.

(1) Remove electrical wiring harness assemblies according to procedures outlined in paragraphs 6-21 through 6-28.

(2) Disconnect all shelter harness assemblies and wires running to and from box using section III as a guide.

(3) Remove bolts and washers used to secure the distribution box to the shelter walls and ceiling. Remove the distribution box.

c. Disassembly. Disassemble distribution box as required to replace damaged parts according to sequence of numbers assigned to figure 6-7, and observing the following.

(1) Remove screw (73, fig. 6-7, sheet 3 of 5), washer (74) and remove lamp retainer ring (75), gasket (76), rivet (77) and nut plate (78). Remove lamp (79).

(2) Remove self adhesive labels (89 and 90) by peeling from surface of distribution box.

(3) Remove fastener stud (92, fig. 6-7, sheet 4 of 5) from door assembly by removing pin (93) from stud (92). Remove fastener receptacle (91) from distribution box by removing rivets.

(4) Remove bolts (94) and clip nuts (95) which secure relay mounting bracket to distribution box.

(5) Remove damaged nut plates (97) by removing rivets (96).

d. Assembly. Using figure 6-7 as a guide, assemble the distribution box as follows:

(1) Replace nut plates (97, fig. 6-7, sheet 4 of 5) and secure with rivets (96).

(2) Replace clip nuts (95) and bolts (94) on distribution box.

(3) Replace fastener receptacle (91) and secure with rivets. Position fastener stud (92) in door assembly hole and replace pin to secure.

(4) Clean label area of distribution box with cleaning solvent to remove all traces of adhesive and remove protective backing from labels (89 and 90, fig. 6-7, sheet 3 of 5). Press firmly into position on distribution box and smooth out any wrinkles or air bubbles under label.

(5) Place nut plate in position and secure with rivet (77). Replace lamp (79), gasket (76), retainer ring (75) and secure with washer (74) and screw (73).

e. Repair. Repair the distribution box assembly as required to return to a serviceable condition as follows.

(1) Inspect distribution box assembly for damaged clip nuts, nut plates, fastener studs and receptacles, nicks, dents, or scratches. Dress all nicks and scratches with emery cloth. Replace damaged clip nuts, fasteners, and nut plates in accordance with disassembly and assembly procedures outlined in steps *c.* and *d.* above. Minor dents are acceptable as long as function or fit of the distribution box is not affected.

(2) Inspect distribution mounting brackets for damage and misalinement. If possible, straighten any bent or misalined brackets by means of a vise, pliers, or hammer.

(3) Repaint distribution box assembly by applying primer and allowing to air dry 18 hours or 30 minutes at 150°F. (66°C) to 300°F. (149°C) and painting with paint conforming to Federal Standard 595, color match No. 24516. Air dry 18 hours or 30 minutes at 150°F. (66°C) to 300°F. (149°C). Apply new labels to repainted distribution box in accordance with step *d*(4) above.

f. Installation. Install the distribution box using figure 6-7 as a guide and observing the following:

(1) Place distribution box in proper position and secure with bolts and washers.

(2) Replace electrical wiring and components in accordance with procedures outlined in paragraphs 6-21 through 6-28 and Section III, Chapter 6.

6-30. Circuit Breakers (101, Figure 6-7, Sheet 5 of 5)

a. General. The circuit breakers (101, fig. 6-7, sheet 5 of 5), provides protection against damage resulting from an overload in the electrical circuit through the sterilizers of X-ray receptacles. The circuit breakers opens the receptacles in the event the electrical load reaches 50 amperes. Opening of the circuit breaker is indicated by the extension of the reset button. The circuit breaker is reset by pressing in on the reset button.

b. Removal. Remove circuit breakers (101, fig. 6-7, sheet 5 of 5) as required to replace damaged or defective circuit breakers as follows.

(1) Remove screws (17, fig. 6-7, sheet 1 of 5) from terminals and disconnect electrical leads.

(2) Remove screws (99, fig. 6-7, sheet 5 of 5) and washers (100) and circuit breakers (101).

c. Installation. Install circuit breakers (101, fig. 6-7, sheet 5 of 5) using figure 6-7 as a guide and observing the following:

(1) Position circuit breakers on panel and secure with screws (99) and washers (100).

(2) Connect wire and terminal assemblies.

6-31. Circuit Breakers (104, Figure 6-7, Sheet 5 of 5)

a. General. Circuit breakers provide protection against damage resulting from an overload in the interior 60 Hertz ceiling and wall receptacles. All the circuit breakers open at 20 amperes. Opening of the circuit breakers is indicated by the extension of the reset button. The circuit breakers are reset by pressing in on the reset button.

b. Removal.

(1) Remove the screws (17, fig. 6-7, sheet 1 of 5) from the terminals and disconnect electrical leads.

(2) Remove nuts (102, fig. 6-7, sheet 5 of 5) and washers (103) used to secure circuit breakers (104) to panel (123).

c. Installation. Install circuit breakers using figure 6-7 as a guide and install as follows:

(1) Install nuts (102, fig. 6-7, sheet 5 of 5) and washers (103) to secure circuit breakers (104) to panel (123).

(2) Install screws (17, fig. 6-7, sheet 1 of 5) to the terminals and connect electrical leads.

6-32. Circuit Breaker (107, Figure 6-7, Sheet 5 of 5)

a. General. Circuit breaker (107, fig. 6-7, sheet 5 of 5) provides protection against damage resulting from an overload in the humidifier receptacle. The circuit breaker opens the receptacle on the event the load reaches 10 amps. Opening of the circuit breaker is indicated by the extension of the reset button. The circuit breaker is reset by pressing in on the reset button.

b. Removal.

(1) Remove the screws (17, fig. 6-7, sheet 1 of 5) from the terminals and disconnect electrical leads from circuit breaker.

(2) Remove nuts (105, fig. 6-7, sheet 5 of 5) and washers (106) used to secure circuit breaker (107) to panel, and pull circuit breaker in a straight line from rear of panel (123).

c. Installation. Install circuit breaker as follows:

(1) Install nuts (105, fig. 6-7, sheet 5 of 5) and washers (106) to secure circuit breaker to panel, and position circuit breaker in a straight line to rear of panel (123).

(2) Install the screws (17, fig. 6-7, sheet 1 of 5) to the terminals and connect electrical leads to circuit breaker.

6-33. Circuit Breaker (110, Figure 6-7, Sheet 5 of 5)

a. General. Circuit breaker (110, fig. 6-7, sheet 5 of 5) provides protection against damage resulting from an overload in the sump pump receptacle. The circuit breaker opens the receptacle in the event the load reaches 3 amps. Opening of the circuit breaker is indicated by the extension of the reset button. The circuit breaker is reset by pressing in on the reset button.

b. Removal.

(1) Remove the screws from the terminals and disconnect electrical leads from circuit breaker (110, fig. 6-7, sheet 5 of 5).

(2) Remove nuts (108) and washers (109) used to secure circuit breaker (110) to panel, and remove by pulling from rear of panel (123).

c. Installation. Install circuit breaker as follows:

(1) Install nuts (108, fig. 6-7, sheet 5 of 5) and washers (109) to secure circuit breaker (110) to panel and install to rear of panel (123).

(2) Install the screws to the terminals and connect electrical leads to circuit breaker (110).

6-34. Circuit Breaker (113, Figure 6-7, Sheet 5 of 5)

a. General. Circuit breaker (113) (fig. 6-7, sheet 5 of 5) provides protection against damage resulting for an overload in the air lock light receptacle. The circuit breaker (113) opens the receptacle in the event the load reaches 25 amps. Opening of the circuit breaker is indicated by the extension of the reset button. The circuit breaker is reset by pressing in on the reset button.

b. Removal.

(1) Remove the screws (17) (fig. 6-7, sheet 1 of 5) from the terminals and disconnect electrical leads.

(2) Remove nuts (111, fig. 6-7, sheet 5 of 5) and washers (112) used to secure circuit breaker (113) to panel, and remove by pulling from rear of panel (123).

c. Installation. Install circuit breaker as follows:

(1) Install nuts (111, fig. 6-7, sheet 5 of 5) and washers (112) to secure circuit breaker (113) to panel, and install by positioning to the rear of panel (123).

(2) Install the screws (17, fig. 6-7, sheet 1 of 5) to the terminals and connect electrical leads.

6-35. Circuit Breakers (116, Figure 6-7, Sheet 5 of 5)

a. General. Circuit breakers (116, fig. 6-7, sheet 5 of 5) provide protection against damage resulting from an overload in the surgical light receptacle and the flurorescent area lights. One circuit breaker opens the receptacle in the event the load reaches 10 amps, and the other circuit breaker opens in the event the load reaches 5 amps. Opening of the circuit breaker is indicated by the extension of the reset button. The circuit breaker is reset by pressing in on the reset button.

b. Removal.

(1) Remove the screws from the terminals and disconnect electrical leads from circuit breakers (116, fig. 6-7, sheet 5 of 5).

(2) Remove nuts (114) and washers (115) used to secure circuit breakers (116) to panel (123), and remove circuit breakers by pulling from rear of panel.

c. Installation. Install circuit breakers as follows:

(1) Install nuts (114, fig. 6-7, sheet 5 of 5) and washers (115) to secure circuit breakers (116) to panels (123), and install circuit breakers by positioning the circuit breaker into the rear of the panel.

(2) Install the screws to the terminals and connect electrical leads to circuit breakers (116).

6-36. Circuit Breakers (119, Figure 6-7, Sheet 5 of 5)

a. General. Circuit breakers (119, fig. 6-7, sheet 5 of 5) provide protection against damage resulting from an overload in the water hose or water line receptacles. The circuit breakers open the receptacles in the event the load reaches 15 amps. Opening of the circuit breaker is indicated by the extension of the reset button. The circuit breaker is reset by pressing in on the reset button.

b. Removal.

(1) Remove screws (17, fig. 6-7, sheet 1 of 5) from the terminals and disconnect electrical leads.

(2) Remove nuts (117, fig. 6-7, sheet 5 of 5), and washers (118) used to secure circuit breakers (119) to panel, and remove by pulling from rear of panel (123).

c. Installation. Install circuit breakers as follows:

(1) Install nuts (117, fig. 6-7, sheet 5 of 5) and washers (118) to secure circuit breakers (119) to panel and install circuit breaker by positioning the circuit breaker into the rear of panel (123).

(2) Install screws (17, fig. 6-7, sheet 1 of 5) to the terminals and connect electrical leads.

6-37. Circuit Breakers (122, Figure 6-7, She 5 of 5)

a. General. Circuit breakers (122, fig. 6-7, she 5 of 5) provide protection against damage resultin from an overload in the 400 Hertz left hand an right hand receptacles, and the 28 vdc surgical an emergency light circuits. The circuit breakers ope the circuit or receptacles in the event the loa reaches 20 amperes. Opening of the circuit breaker is indicated by the extension of the reset button. Th circuit breaker is reset by pressing in on the rese button.

b. Removal.

(1) Remove the screws (17, fig. 6-7, sheet 1 of 5) from the terminals and disconnect electrical leads.

(2) Remove nuts (120 fig. 6-7, sheet 5 of 5) and washers and washers (121) used to secure circuit breakers (122) to panel (123) and remove by pulling from rear of panel (123).

c. Installation. Install circuit breaker in reverse order of removal using figure 6-7 as a guide.

6-38. Terminal Board (52, Figure 6-7, Sheet 2 of 5)

a. Removal. Remove terminal board according to sequence of index numbers assigned to figure 6-7 and observing the following.

(1) Remove cover (49, fig. 6-7, sheet 2 of 5) from terminal board (52).

(2) Remove nut (53), lockwasher (54), and washer (55). Remove electrical leads from terminals 1 through 5.

NOTE

Mark or otherwise identify electrical leads for ease at installation.

(3) Remove nut (50) and screw (51) from terminals board (52) and remove from distribution box.

b. Installation. Install terminal board (52, fig. 6-7, sheet 2 of 5) using figure 6-7 as a guide and observing the following:

(1) Position terminal board (52, fig. 6-7, sheet 2 of 5) in distribution box and secure with nuts (50) and screws (51).

(2) Replace electrical leads on proper terminals. Secure leads with washer (55), lockwasher (54) and nut (53).

(3) Press terminal baord cover (49) securely over terminal board.

6-39. Terminal Board (60, Figure 6-7, Sheet 2 of 5).

a. Removal. Remove terminal board (60, fig. 6-7, sheet 2 of 5) according to sequence of index numbers

(3) Press cover (42) on terminal board (45).

6-43. Terminal Board (68, Fig. 6-7, Sheet 2 of 5)

NOTE

The following removal procedures apply to shelter serial No. 1 thru 184 only.

a. Removal. Remove terminal board (68, fig. 6-7, sheet 2 of 5) according to sequence of index numbers assigned to figure 6-7 and observing the following.

(1) Remove cover (65, fig. 6-7, sheet 2 of 5) from terminal board (68).

(2) Remove nuts (69), lockwashers (70), and washers (71), and remove electrical leads from terminals 1 through 6.

NOTE

Mark or otherwise identify electrical leads for ease at installation.

(3) Remove nuts (66) and screws (67) which secure the termiboard (68) to the distribution box.

b. Installation. Using figure 6-7 as a guide, install terminal board as follows:

(1) Position terminal board (68, fig. 6-7, sheet 2 of 5) in distribution box and secure with nuts (66) and screws (67).

(2) Replace electrical leads on proper terminals and secure with washers (71), lockwashers (70) and nuts (69).

(3) Press cover (65) firmly in place over terminal board (68).

CHAPTER 7
REPAIR OF CONDITIONED AIR SYSTEM

Section I. CONNECTION COMPONENTS

7-1. General

This section provides instructions for replacement of those items considered as connection components for the conditioned air system. They consist of the air duct assembly, air duct adapter coupling clamps, duct covers, air distribution plenum and the air duct adapter flange.

7-2. Air Duct Assembly, Coupling Clamps, and Duct Covers

a. General. The duct covers are hinged formed metal discs that are used to cover the shelter air inlet and outlet ducts when ducts are not in use. The coupling clamps are standard V-clamp used to secure the air duct assembly to the shelter air duct adapter. The air duct assembly is a wire reinforced, insulated fabric, flexible duct used to connect a conditioned air source to the shelter inlet duct.

b. Removal. Remove air duct assembly, distribution plenum coupling clamps, air duct adapter and duct covers as described below.

(1) Disconnect air duct assemblies (2, fig. 7-1) from source of conditioned air.

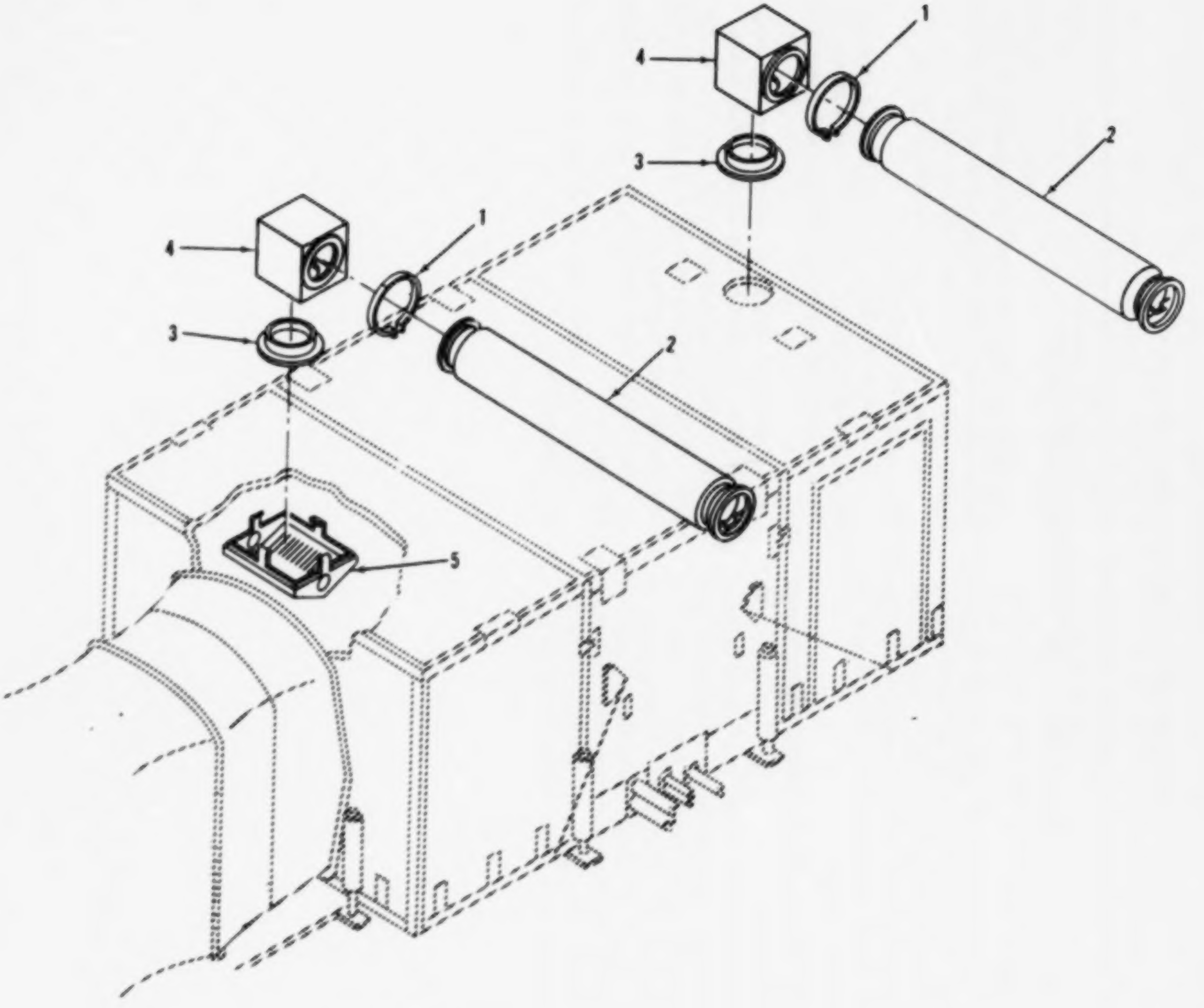
(2) Loosen coupling clamp (1) and disconnect air duct assemblies (2) from air duct adapter (4). Remove coupling clamps (1) and air duct assemblies (2).

c. Installation. Install air duct assembly, coupling clamps, and duct covers as described below.

(1) Install duct assembly (2, fig. 7-1) at conditioned air inlet flange on air duct adapter (4) and secure with coupling clamp (1).

(2) Position duct assembly (2) along roof panel and secure.

(3) Connect duct assemblies (2) to source of conditioned air.



1. Air duct clamps (2)
2. Conditioned air duct (2)
3. Flange assembly (2)
4. Air duct adapter (2)
5. Air distribution plenum

Figure 7-1. Conditioned Air System Removal (TS 013816)

Section II. CONTROL COMPONENTS

7-3. General

This section provides instructions for replacement of those items considered as components of the conditioned air control system. They consist of a remote temperature sensor receptacle and a humidifier receptacle used only when the shelter is designated as a surgical unit.

7-4. Remote Temperature Sensor Receptacle and Harness

a. General. The remote temperature sensor harness and receptacle provide a means of interconnecting a temperature sensor from the shelter interior to the remote conditioned air source for precise temperature control of the shelter air. The harness assemblies consist of an exterior receptacle and harness which runs through the shelter electrical raceway to the distribution box where it connects to the interior receptacle and harness assembly. **The remote temperature sensor harness and receptacle are installed on shelter serial No. 1 thru 184 only.**

b. Removal. Remove the exterior harness and receptacle (4, FO-3). Remove the interior harness and receptacle assembly.

c. Installation. Install the interior and exterior receptacle and harness assemblies as described in paragraphs 6-15g and 6-28*j*.

7-5. Humidifier Receptacle and Harness Assembly

a. General. The humidifier receptacle and harness assembly (10, fig. 6-7, sheet 1 of 5) provides for connection of a humidifier to control the humidity inside the shelter.

b. Removal. Remove the humidifier receptacle and harness assembly as described in paragraph 6-16*b*.

c. Installation. Install the humidifier receptacle and harness assembly as described in paragraph 6-*f*.

CHAPTER 8

REPAIR OF SHELTER BODY ASSEMBLIES

Section I. FOLDING PANEL ASSEMBLIES

8-1. General

This section provides instructions for replacement of those items considered as part of the folding panel assemblies. They consist of four door panel assemblies, folding end jack assemblies, folding side panels, folding end panels, folding floor panels and folding roof panels. (fig. 8-1)

8-2. Door Panel Assemblies

a. General. The door panel assemblies are a metal faced honeycomb core panel. They consist of a weather seal assembly on the door inner edge, a hinge assembly, door stops, window assemblies with blackout curtains, and an anti-backdraft valve located on one of the panel assemblies at each side of the shelter (fig. 8-2).

b. Removal. Remove the door assemblies according to sequence of index numbers assigned to figure 8-2 and observing the following.

(1) Remove grounding straps located at the upper left and right hand corners of the doors.

(2) Remove the captive screws (1, fig. 8-2) on the side panel side of the hinge (11) and the pan head screws securing the hinge to the edge of the side panels (60, 61, FO-4) (located in back of manual).

(3) Remove doors (75, 76, fig. 8-2) from the folding side panels.

c. Disassembly. Disassemble the door panel assemblies for replacement of damaged parts according to sequence of index numbers assigned to figure 8-2 and observing the following.

(1) Remove washer (2, fig. 8-2) and retainer washer (3) from captive screw (1).

(2) Remove screw (4), rivets (6 and 7) which secure hinge half (10) to door panel assemblies. Remove blind nut (5).

(3) Remove hinge pin (8) and separate hinge halves (10 and 11), and torsion springs (9).

(4) Remove screw (12), washer (13) and remove ground rod (14) from panel.

(5) Remove screw (15) to remove upper bar retainer (17) from panel. Remove rivet (19) and remove lower bar retainer (20) and retainer shim (21). Remove blind nut (16).

(6) Remove screws from lock assembly plate and remove lock assembly from door. Disassemble door lock assembly according to sequence of index numbers assigned to detail A and observing the following.

(*a*) Remove screws (22 and 23) and remove handle bar (24). Remove nut (25), washer (26), and screw (27); remove locking bar (28), handle bail (29), keeper plate (30) and stop arm (31).

(*b*) Remove screw (32) and remove idler block (33), stop arm (34), keeper plate (30) and locking blade (35).

(*c*) Remove screw (23) to remove interior handle bar (24), and handle bail (29).

(7) Remove rivet (36), window frame (37), spacer (38) and window (39). Remove blackout curtain pile tape (41 and 42) by peeling from window frame (37). Remove closeouts (40) by running a knife or other sharp instrument between closeout and paper honeycomb core.

(8) Remove push plate (43) from door by breaking adhesive bond and peeling from door.

(9) Remove door stop (45) by removing rivet (44). Remove kick plate (47) by removing rivets (46).

(10) Remove rivnut (48) from door by drilling out with drill bit of the same diameter as the rivnut.

(11) Remove and disassemble anti-backdraft valve by observing the following.

(*a*) Remove screw (49) and remove housing assembly (51), gasket (52), and grill (53).

(*b*) Remove damper assembly (60) by removing cotter pin (54) from pin (55). Remove pin (55) and washers (56) from hinges to allow damper assembly (60) to be removed from housing assembly (51).

(*c*) Remove counterweight (59) by removing nut (57) and screw (58) from counterweight support (65).

(*d*) Remove hinges (62 and 63) by removing rivets (61).

(*e*) Remove counterweight support (65) by removing rivet (64).

(12) Remove closeouts (66 and 67) by running a knife or other sharp tool between the closeout and the paper honeycomb core.

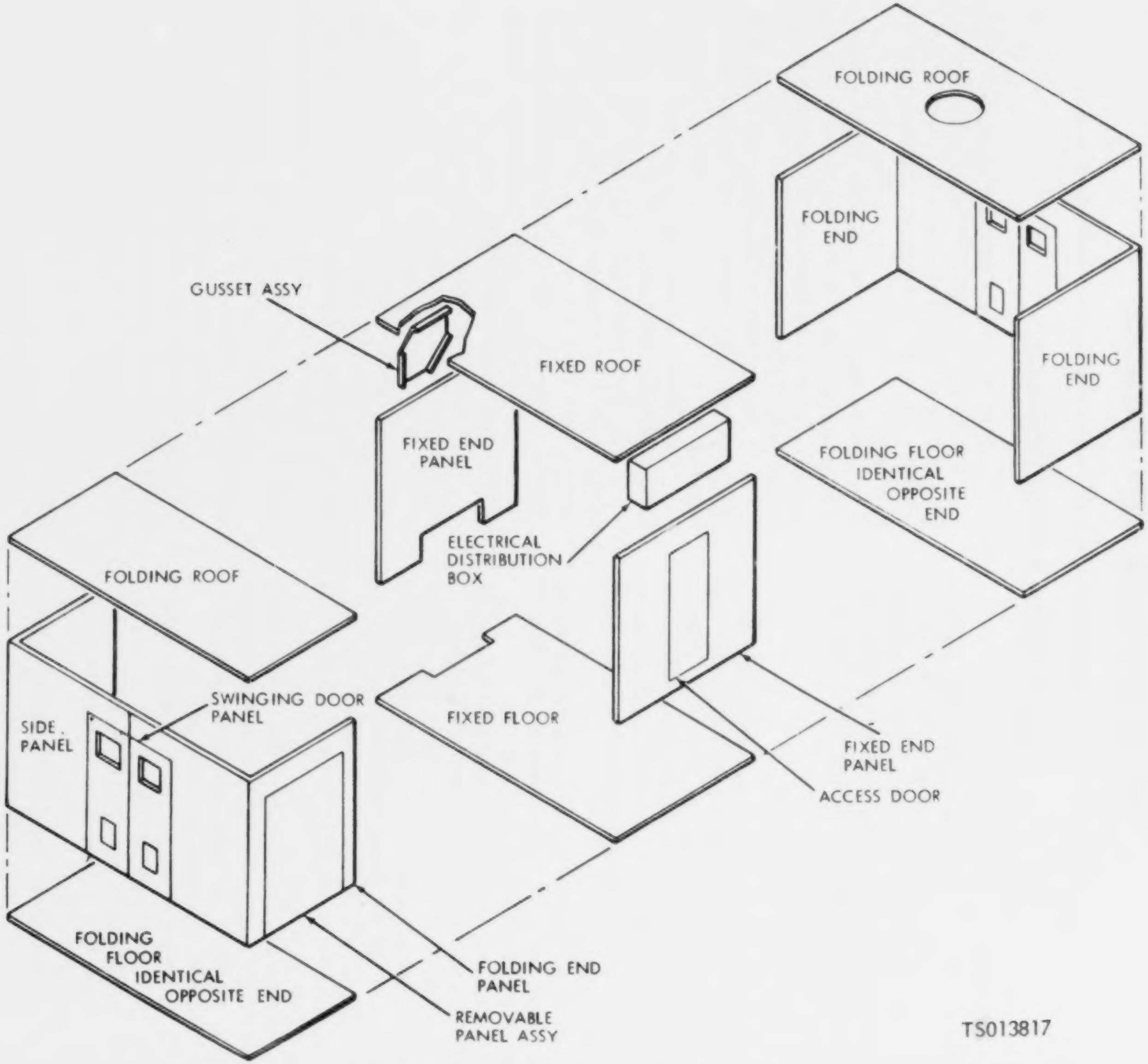

FOLDING ROOF
FOLDING END
FOLDING END
FOLDING FLOOR IDENTICAL OPPOSITE END
GUSSET ASSY
FIXED ROOF
FIXED END PANEL
ELECTRICAL DISTRIBUTION BOX
FOLDING ROOF
FIXED FLOOR
FIXED END PANEL
ACCESS DOOR
SWINGING DOOR PANEL
SIDE PANEL
FOLDING FLOOR IDENTICAL OPPOSITE END
FOLDING END PANEL
REMOVABLE PANEL ASSY
TS013817

Figure 8-1. Shelter Body Assembly Panel Identification (TS 013817)

(13) Remove seal assembly (70) by removing rivets (68) and retainer strip (69).

(14) Remove closeouts (71 and 72) using procedure given in step (12) above.

(15) Remove door pull (74) from door panel assemblies (75 and 76) by removing rivets (73).

d. Overhaul. Overhaul the door-panel assemblies as required to return to a serviceable condition per chapter 8, section III, paragraph 8-16.

e. Assembly. Assemble the door panel assemblies using figure 8-2 as a guide and observing the following:

(1) Install blind nuts and rivnuts using installation procedures recommended by the manufacturer.

(2) Replace rivets.

(3) During assembly of door window assemblies, place a bead of EC 776, 3M Co., or equivalent, around edge of outer window (39, fig. 8-2). Paint interior surface of spacer (38) with one coat of TT-E-527, Color 3407 per Federal Standard 595.

(4) Assemble closeouts (40, 66, 67, 71 and 72) on door panel assemblies.

f. Installation. Install the door assemblies observing the following.

(1) Position the doors and secure the hinges to the side panels with the the captive screws (1, fig. 8-2). Adjust doors to assure that no binding or rubbing is present.

(2) Replace the grounding straps at the upper left and right hand corners.

8-3. Folding Floor Jack Assemblies

a. General. The folding floor jack assemblies are used to level the folding ends of the expandable shelter.

b. Removal. Jack assembly (10, fig. 4-21, sheet 2 of 2) shall be removed observing the following.

(1) Unscrew bolt (6, fig. 4-21, sheet 2 of 2) from panel and remove nut (7).

(2) Remove bolts (8) from attaching bracket and the four flat head screws (9) from bottom of bracket. Remove jack assembly (10).

c. Installation. Install jack assembly using figure 4-21 as a guide and observing the following.

(1) Replace retainer nut (7, fig. 4-21, sheet 2 of 2) on bolt (6).

(2) Place jack assembly (1) into position and screw bolt (6) into shelter.

(3) Replace bolt (8) and flat head screws (9) and tighten all bolts and screws securely.

8-4. Folding Side Palen Repair Procedures

a. General. The folding side panel assemblies are an aluminum faced honeycomb core panel which house the door assemblies. There are four side panel assemblies on the shelter: two at each side (fig. 8-1).

b. Removal. Remove the side panel assemblies as follows.

(1) Remove the folding floor jack assemblies as described in paragraph 8-3.

(2) Disengage all latches and hardware which attach the side panels to the folding roof panels and folding floor panels observing the procedures given on the shelter instruction plate located on the door.

(3) Remove the grounding straps between the folding end panels and folding side panels.

(4) Remove screw (1, FO-4) (located in back of manual) and washers (2) which secure the hinge half (11) to the folding end panels. Lift up the folding roof panel and support roof using the adjustable roof support; remove the side panel assemblies.

c. Disassembly. Disassemble the side panels as required to replace damaged parts according to sequence of numbers assigned to FO-4 (located in back of manual), and observing the following.

(1) Remove screws (3, FO-4) (located in back of manual), washers (4), rivets (6) and screws (7) and remove hinge assembly from panel edge. Remove hinge pin (10) by pulling in a straight line using pliers or other suitable tool to grip the pin. Separate hinge half (11) from hinge half (12).

(2) Remove insert (8) using procedure outlined in paragraph 4-48*a*.

NOTE

Remove loose particles from the hose using a compressed air blast with clean air.

(3) Remove rivets (13) which secure angles (14) to side panel.

(4) Remove closeouts (15) by sliding a sharp knife or other suitable tool between closeout and honeycomb paper core using care not to damage panel or honeycomb core.

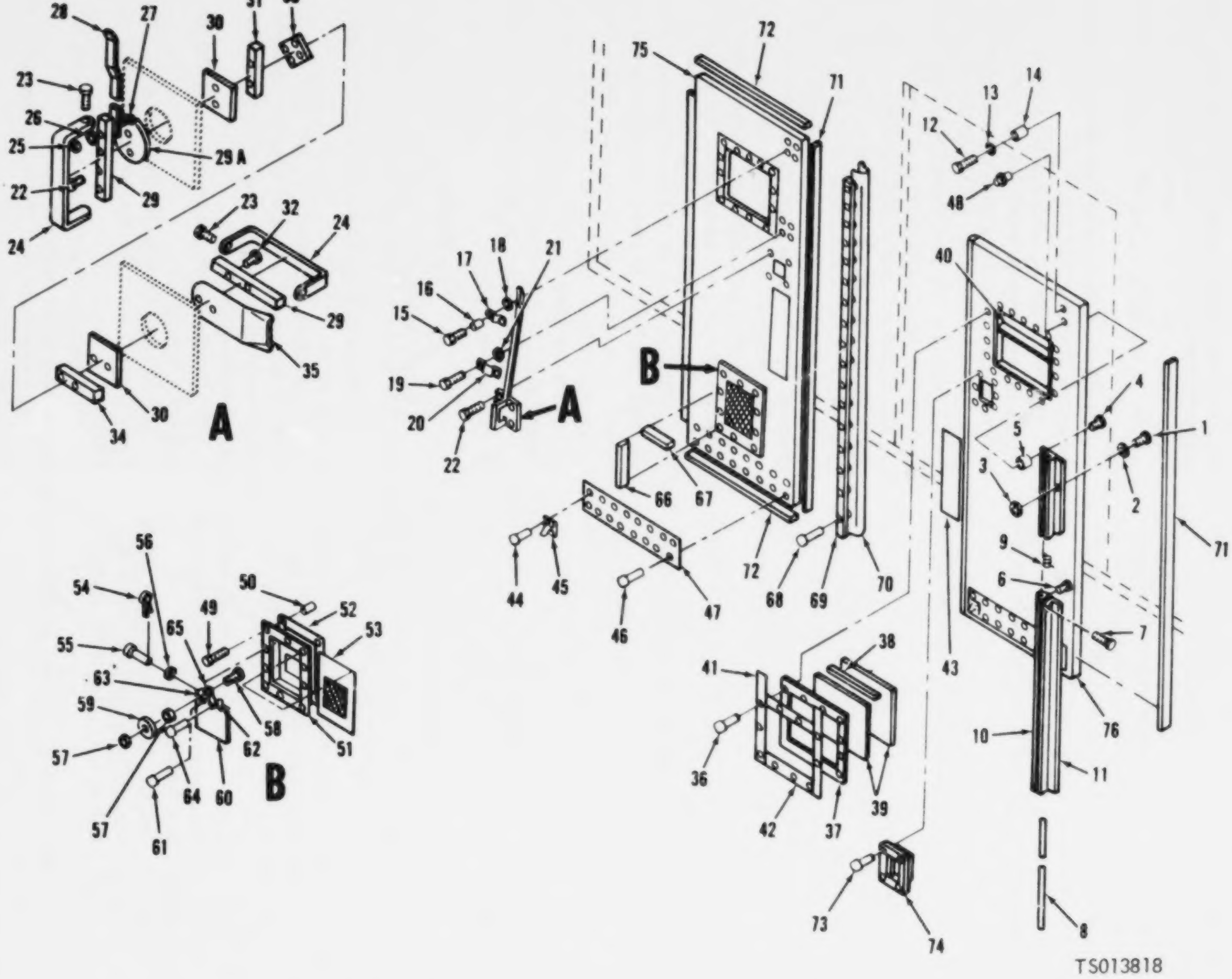
(5) Remove screw (16), washer (17) and ground rod (18) from panel.

(6) Remove rivnut (19) from panel by drilling using a drill bit with the same diameter as the rivnut.

(7) Remove rivnut (20) which secures the top angles (21) to the panel top edge.

(8) Remove closeout (22) using procedure given in step c(4), above.

(9) Remove tee (25) by removing rivet (24).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TS013818

Figure 8-2. Swinging Door Panel Assemblies - Disassembly (TS 013818)

1. Captive screw (10)
2. Washer (10)
3. Retainer washer
4. Screw (4)
5. Blind nut ay (4)
6. Rivet (40)
7. Rivet (40)
8. Hinge pin (2)
9. Torsion spring (16)
10. Hinge half, door
11. Hinge half, side
12. Screw (4)
13. Washer (4)
14. Ground rod (2)
15. Screw (4)
16. Blind nut (4)
17. Upper bar retainer
18. Retainer shim
19. Rivet (4)
20. Lower bar retainer
21. Retainer shim
22. Screw (2)
23. Screw (4)
24. Handle bar
25. Nut
26. Washer
27. Screw
28. Locking bar
29. Handle bail
29A. Spacer
30. Keeper plate
31. Stop arm
32. Screw
33. Idler block
34. Stop arm
35. Locking blade
36. Rivet (80)
37. Window frame
38. Spacer
39. Window
40. Closeout
41. Pile tape
42. Pile tape
43. Push plate
44. Rivet (8)
45. Door stop
46. Rivet (36)
47. Kick plate
48. Rivnut (2)
49. Screw (10)
50. Blind nut (10)
51. Housing ay
52. Gasket
53. Grill
54. Cotter pin (2)
55. Pin (2)
56. Washer (4)
57. Nut (2)
58. Screw
59. Counterweight
60. Damper ay
61. Rivet (4)
62. Hinge
63. Hinge
64. Rivet (2)
65. Counterweight support
66. Closeout (2)
67. Closeout (2)
68. Rivet (48)
69. Strip (2)
70. Seal ay (2)
71. Closeout (4)
72. Closeout (2)
73. Rivet (24)
74. Door pull
75. Door panel ay, L.H.
76. Door panel ay, R.H.

Figure 8-2 – Continued

(10) Remove bulb and tail seal (26) by peeling from cemented area on tee (25).

(11) Remove bulb seal (27) by peeling from cemented area on tee (25).

(12) Remove closeout (28) using procedure given in paragraph 8-c. (4).

(13) Remove tee (31) by removing rivets (29 and 30).

(14) Remove bulb and tail seal (32) by peeling from cemented area on tee (31).

(15) Remove closeout (33) per paragraph 8-4c. (4).

(16) Remove ball lock receptacle (35) from panel by removing rivet (34).

(17) Remove rivets (36 and 37) and remove shim (38) and latch assembly (39) from the panel.

(18) Remove latch assembly (41) from panel by removing rivets (40).

(19) Remove alignment plate (43) from panel by removing rivets (42).

(20) Remove right hand adapter frame (46) and left hand adapter frame (47) from panel by removing screws (44). Remove rivnut (45) from panel by drilling using a drill bit with the same diameter as the rivnut.

(21) Remove tee (50) by removing rivets (48 and 49).

(22) Remove bulb and tail seal (51) by peeling from cemented area on tee (50).

(22.1) Remove two seals (51A) by peeling from cemented area on closeout (52).

(23) Remove closeout (52) per paragraph 8-4c. (4).

(24) Remove rivet (53) and remove latch and box assembly from panel. Remove rivet (54) and separate latch (55) from latch box (56).

(25) Remove rivet (57) to remove angle (58) from panel bottom edge.

(26) Remove closeout (59) per paragraph 8-4c. (4).

d. Repair.

(1) Repair damage to honeycomb core panel assemblies using procedures described below.

(a) Mixing of two part adhesive. Mixing of adhesive, used for repair of honeycomb core, shall be accomplished as follows.

1. Use a mixing ratio of from 50 parts accelerator to 50 parts base by volume, to 100 parts accelerator to 100 parts base by volume.

WARNING

Adhesives and solvents are highly flammable; perform work in well ventilated area and away from fire.

2. Add the proper amount of adhesive base and accelerator to a mixing cup (from repair kit) and mix thoroughly using a mixing paddle from the repair kit. The pot life of the adhesive after mixing is 45 minutes.

(b) Repairing honeycomb panel with damage to one surface only. Repair damaged honeycomb panel as follows.

1. Trim the damaged area of the aluminum facing using tin snips, circular saw or other suitable tool (fig. 8-3).

2. Trim honeycomb core with a knife to the same size as the trimmed hole in the facing through the entire thickness of the core (fig. 8-3).

NOTE

In general, trimmed holes are not restricted as to size or shape; however, those of rectangular, circular, square and oval and rectangular with round ends usually are more desirable as to appearance and ease of installation.

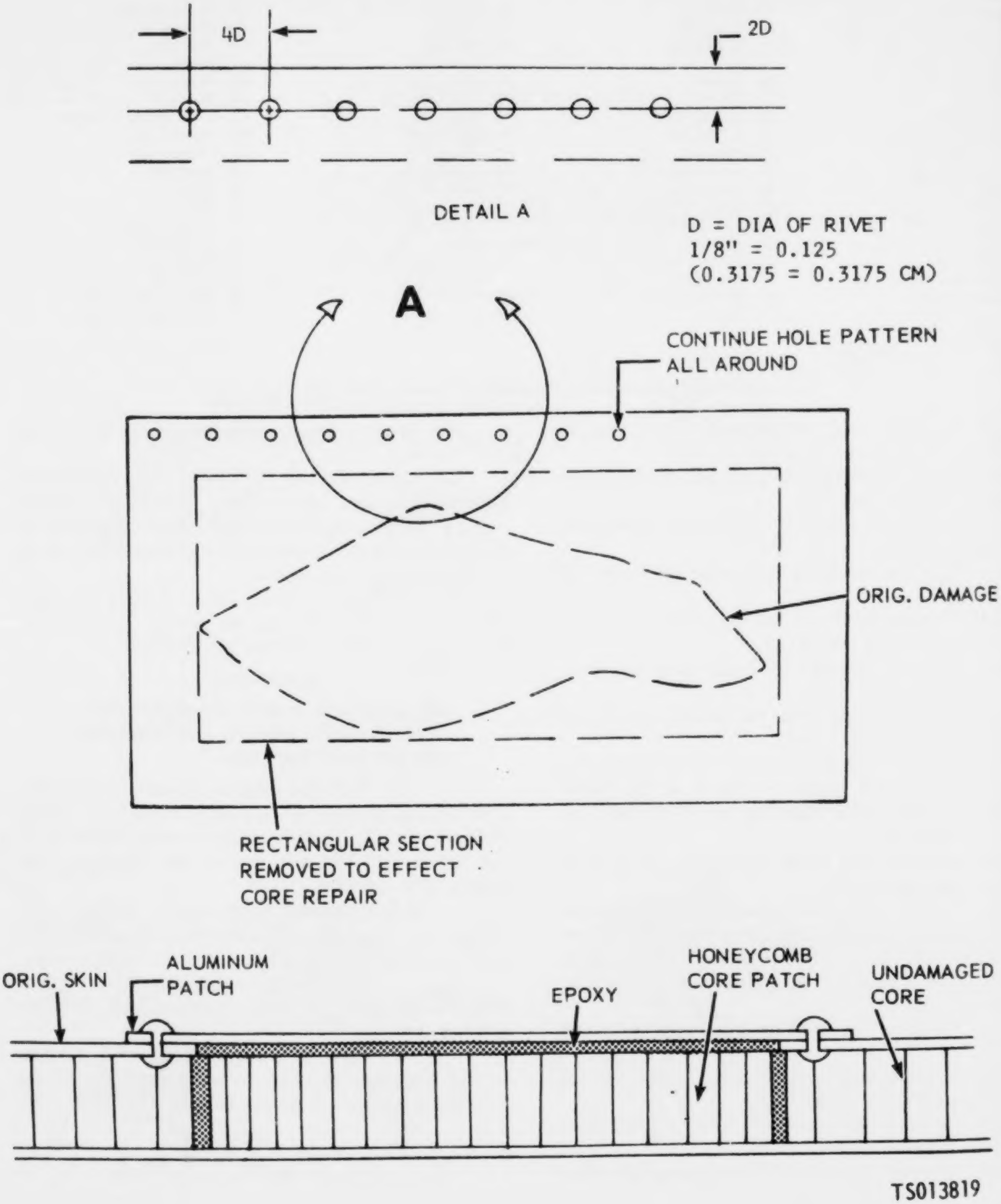

4D
2D
DETAIL A
D = DIA OF RIVET
1/8" = 0.125
(0.3175 = 0.3175 CM)
A
CONTINUE HOLE PATTERN ALL AROUND
ORIG. DAMAGE
RECTANGULAR SECTION REMOVED TO EFFECT CORE REPAIR
ORIG. SKIN
ALUMINUM PATCH
EPOXY
HONEYCOMB CORE PATCH
UNDAMAGED CORE
TS013819

Figure 8-3. Typical Honeycomb Panel Repair (TS 013819)

3. Clean the interior surface of the undamaged facing with emery cloth, and a clean lintfree cloth soaked with methylethyl-ketone.

4. Cut a section of honeycomb core material the same size as the trimmed hole using the honeycomb furnished with the repair kit.

5. Fabricate plug patch plate which will overlap hold opening by approximately 3 inches (8 cm) on all sides using figure 8-3 as a guide.

6. Drill rivet holes in the patch plate using a number 30 drill (0.128-0.132 inch (0.3251 cm - 1.3353 cm) diameter) and spaced as illustrated in figure 8-3.

7. Drill matching holes in the panel using the patch plate as a template.

8. Apply a thin coat of adhesive to the cleaned interior facing step *3* above), the edges of the honeycomb core.

9. Insert the honeycomb core into the trimmed area of the panel and press firmly in place. Fill area above core eith adhesive and place plug patch in position.

10. Secure the patch plate in position using ⅛ inch (0.3175 cm) domed head blind rivets (from repair kit), using procedures given in section XII, Chapter 4.

11. Apply primer and after primer is dry repaint repair area using paint conforming to Federal Standard 595, Color Chip 34087 (para 8-18).

(c) *Repair to honeycomb panel with damage to both surfaces.* Damage to a panel which penetrates both surfaces shall be repaired using procedure given in paragraph *c.* (2) (*b*) above. Both facings shall be repaired.

(d) *Repair to fabric floor covering.* Repair damage or worn floor fabric as follows.

1. With a sharp knife cut a square area from around damaged or worn section.

NOTE

If aluminum facing or honeycomb core is damaged, repair using procedures given in paragraph 8-7 *d.* (2) steps (*a*) thru (*e*)(*i*) and (*j*). Do not install doubler plate in order to assure a smooth surface.

2. Peel away damaged flooring. Use the removed flooring as a template and cut a new section using the velstat flooring fabric supplied in the repair kit.

3. Thoroughly clean the repair area with emery cloth and a clean, lint-free cloth soaked in methyl-ethyl-ketone.

4. Apply a thin coat of the one part adhesive, supplied with the repair kit, to the floor surface and also to the floor fabric.

5. Press the patch over the trimmed damaged area and work out any trapped air bubbles.

NOTE

The patch should be laid on gradually, one side on the other, or from the center to the edges, to minimize the possibility of entrapped air. Use two men to apply patches larger than four inches, one to hold the top edges up and away from prepared surface while the other starts applying patch evenly and smoothly from the bottom. This will prevent the patch from wrinkling and forming air bubbles.

6. Cover the seams of the repaired area with mylar tape (supplied with repair kit).

(e) *Repair to damaged honeycomb panel edging (closeouts).* Repair damaged panel edging as follows.

1. Remove the damaged phenolic edging with a sharp knife to cut away from honeycomb core, using care to prevent damage to honeycomb core and aluminum facing edge.

2. Cut a section of phenolic edging the same size as the damaged area and apply a thin coat of the two part adhesive to the phenolic edging back.

3. Press the edging firmly in place and allow to cure for a minimum of 8 hours.

(2) Replace any damaged inserts. If possible straighten any bent plates tees angles or latches. Repair damaged closeouts per paragraph (1) above.

e. Overhaul. Overhaul the side panel assemblies (60, 61, FO-4) (located in back of manual) as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the side panel assemblies using FO-4 (located in back of manual) as a guide and observing the following.

(1) Install all blind nuts and rivnuts using installation procedures recommended by the manufacturer.

(2) Replace all rivets.

(3) Seal all cracks around hinge half edges with sealant EC776, 3M Co., or equivalent.

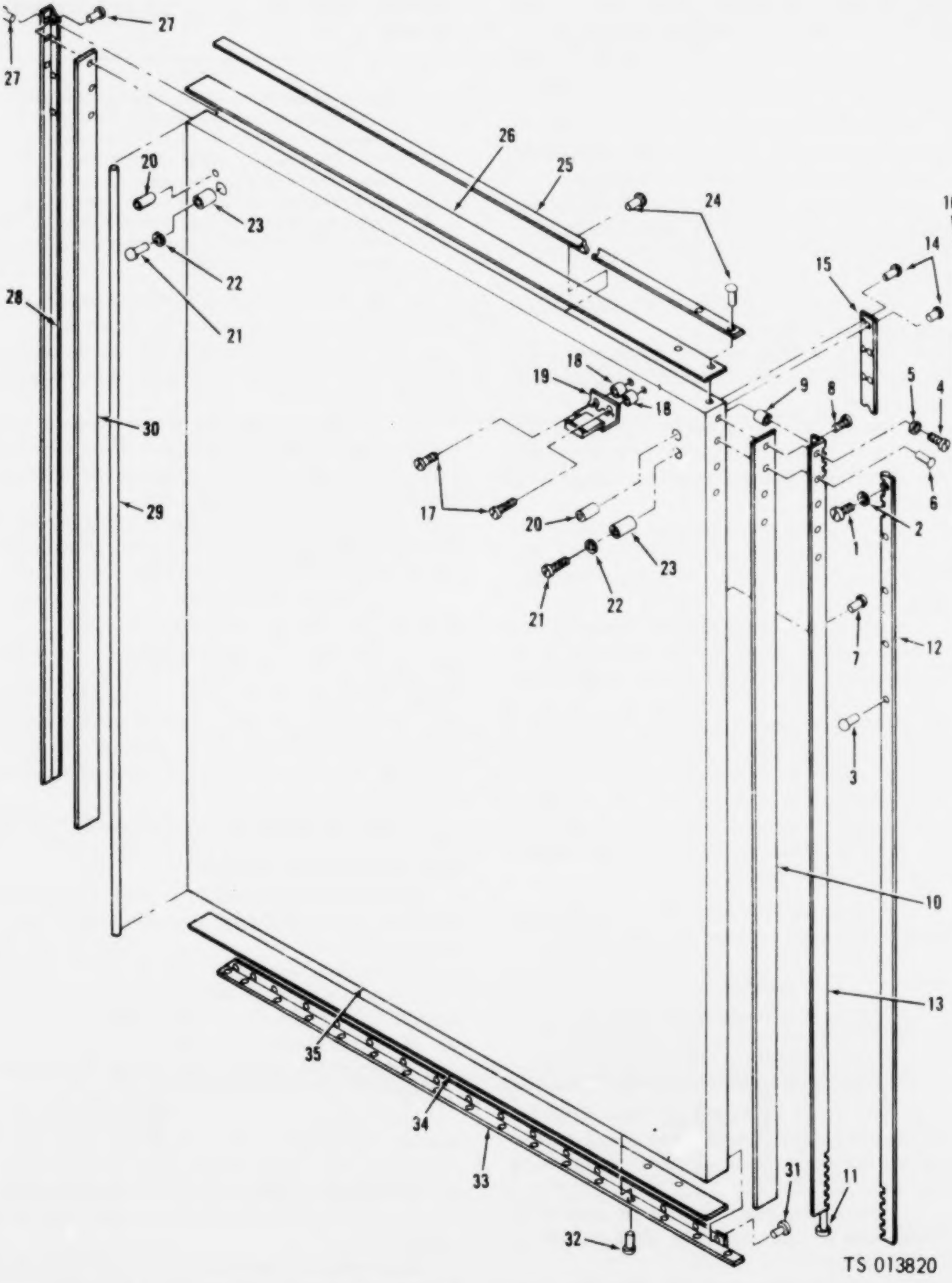
(4) Cement seal assemblies.

g. Installation. Install the panel assembly as follows:

(1) Push down on the folding roof panel and support roof using the adjustable roof support; install the side panel assemblies. Install screw (1, FO-4) (located in back of manual) and washers (2) and secure the hinge half (11) to the folding end panels.

(2) Install the grounding straps between the folding end panels and folding side panels.

(3) Engage all latches and hardware which attach the side panels observing the procedures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TS 013820

Figure 8-4. Folding End Panel Assembly, Disassembly (TS 013820)

1. Screw (2)
2. Washer (2)
3. Rivet (28)
4. Screw (2)
5. Washer (2)
6. Rivet (26)
7. Rivet (24)
8. Screw (4)
9. Blind nut (4)
10. Closeout
11. Hinge pin
12. Hinge half, fixed panel
13. Hinge half, folding panel
14. Rivet (58)
15. Thermal strip
16. Seal, bulb and tail
17. Screw (2)
18. Blind nut (2)
19. Hinge assembly
20. Rivnut (2)
21. Screw (2)
22. Washer (2)
23. Ground rod
24. Rivet (36)
25. Angle
26. Closeout
27. Rivet (42)
28. Angle
29. Seal
30. Rivet (22)
31. Rivet (22)
32. Rivet (22)
33. Angle
34. Closeout
35. Panel assembly

Figure 8-4 — Continued.

given on the shelter instruction plate located on the door.

(4) Install the folding floor jack assemblies.

8-5. Folding End Panel Assemblies

a. General. The folding end panels are an aluminum faced honeycomb core panel. The shelter is equipped with two folding end panels (fig. 8-1).

b. Removal. Remove the folding end panel assemblies as follows.

(1) Disengage all latches and hardware which secure the folding end panels to the folding floor panel.

(2) Remove the grounding straps between the fixed end panels and folding end panels, and between the folding side panel and folding end panel.

(3) Remove the screws (1, fig. 8-4) and washers (2) and rivets (3) which secure the hinge assemblies to the fixed end panels and the folding side panels and remove the folding end panel.

c. Disassembly. Disassemble the folding end panel assemblies as required to replace damaged parts according to sequence of numbers assigned to figure 8-4 and observing the following.

(1) Remove screw (4, fig. 8-4), washer (5) and rivets (6) to remove hinge assembly from panel. Remove blind nut (9).

(2) Remove closeout (10) from panel edge.

(3) Remove hinge pin (11) and separate hinge half (12) from hinge half (13).

(4) Remove rivets (14) and remove thermal strip (15). Remove bulb and tail seal from thermal strip (15) by peeling from cemented area.

(5) Remove hinge assembly (19) from panel by removing screws (17). Remove blind nuts (18) from panel by drilling using a drill bit with a diameter the same size as the blind nut.

(6) Remove rivnut (20) by drilling using a drill bit having the same diameter as the rivnut.

(7) Remove screw (21), washer (22), and remove ground rod (23).

(8) Remove rivets (24) and remove angle (25) from top edge of panel.

(9) Remove closeout (26) from panel edge by inserting a knife or other sharp tool between closeout and panel honeycomb core.

(10) Remove rivets (27) and remove angle (28) from panel edge. Remove closeout (30) from panel edge.

(11) Remove seal (29) by peeling from cemented area.

(12) Remove rivets (31 and 32) which secure angle (33) to panel bottom edge. Remove closeout (34) from panel assembly (35) bottom edge.

d. Repair. Repair damage to honeycomb core panel using procedured outlined in paragraph 8-4. If possible, straighten any bent plates, angles, or latches. Repair damaged closeouts per paragraph 8-4.

e. Overhaul. Overhaul the folding end panel as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the folding end panel assemblies using figure 8-4 as a guide and observing the following:

(1) Install blind nuts and rivnuts using manufacturers recommended procedures.

(2) Replace rivets.

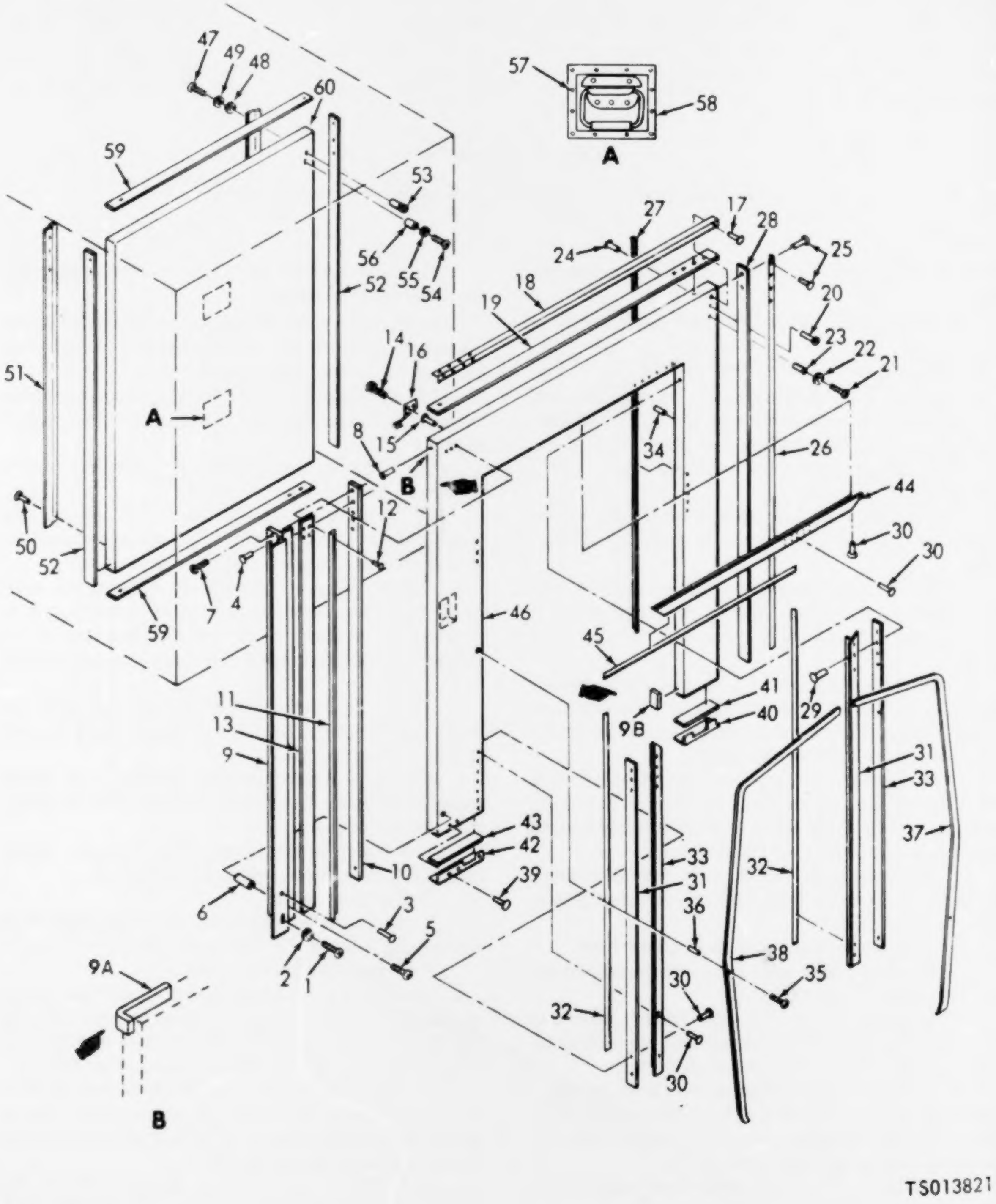
(3) Seal all cracks around hinge half edges with sealant EC776, 3M Co., or equivalent.

(4) Cement seal assemblies.

g. Installation. Refer to shelter instruction plate on the shelter door for procedures on securing the end panel assembly to the folding floor and folding side panels. Install the panel assembly as follows:

(1) Install the screws (1, fig. 8-4) and washers (2) and rivets (3) to secure the hinge assemblies to the fixed end panels and the folding side panels and install the folding end panel.

(2) Install the grounding straps between the fixed end panels and folding end panels, and between the folding side panel and folding end panel.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9A
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32
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B
TS013821

Figure 8-5. End Panel Assembly, Disassembly (With Removable Panel) (TS 013821)

1. Screw (2)
2. Washer (2)
3. Rivet (25)
4. Rivet (56)
5. Screw (2)
6. Blind nut (2)
7. Screw (4)
8. Blind nut (4)
9. Hinge assembly
*9A. Seal
*9B. Seal
10. Closeout
11. Seal, bulb and tail
12. Rivet (58)
13. Thermal strip
14. Screw (2)
15. Blind nut ay (2)
16. Hinge ay
17. Rivet (34)
18. Angle
19. Closeout
20. Rivnut
21. Screw (2)
22. Washer (2)
23. Ground rod
24. Blind nut
25. Rivet (44)
26. Angle
27. Seal
28. Closeout
29. Rivet (66)
30. Rivet (66)
31. Tee
32. Seal, bulb and tail
33. Closeout
34. Blind nut (10)
35. Screw
36. Rivnut
37. Adapter frame, R.H.
38. Adapter frame, L.H.
39. Rivet (6)
40. Angle
41. Closeout
42. Angle
43. Closeout
44. Tee, upper
45. Seal, bulb and tail
46. End panel ay
47. Screw (10)
48. Washer (10
49. Lockwasher (10)
50. Rivet (23)
51. Strap
52. Closeout
53. Rivnut
54. Screw (2)
55. Washer (2)
56. Ground rod
57. Rivet (24)
58. Handle assembly
59. Closeout
60. Removable panel

*Installed on shelter serial No. 402 and subsequent.

Figure 8-5 – Continued.

(3) Engage all latches and hardware to secure the folding end panels to the folding floor panel.

8-6. Folding End Panels W/Removable Panel

a. General. The folding end panels are an aluminum faced honeycomb core panel equipped with a removable insert panel for use when attaching to an adjacent shelter, by means of a bellows adapter (fig. 8-1).

b. Removal. Remove the folding end panels as follows.

(1) Disengage all latches and hardware which secures the folding end panels to the folding floor panel and observing the procedures given on the shelter instruction plate located on the access door.

(2) Remove the grounding straps between the fixed end panels and folding end panels, and between the folding side panel and folding end panel.

(3) Remove the screws (1, fig. 8-5), washers (2) and rivets (3) which secure the hinges to the fixed end panel and the folding side panels and remove the folding end panel.

c. Disassembly. Disassemble the end panel assemblies as required to replace damaged components according to sequence of index numbers assigned to figure 8-5 and observing the following.

(1) Remove rivets (4, fig. 8-5), screws (5) and remove hinge assembly (9) from panel edge. Remove blind nut (6) and blind nut (8) from panel edge.

(1.1) Remove seals (9A and 9B) by peeling from cemented area.

(2) Remove closeout (10) by sliding a knife or other sharp tool between closeout and panel core.

(3) Remove bulb and tail seal (11) from thermal strip (13). Remove thermal strip (13) by removing rivets (12).

(4) Remove screw (14) to remove hinge assembly (16). Remove blind nut (15) from panel by drilling.

(5) Remove rivet (17) and angle (18) from top edge of panel. Remove closeout (19) using procedure given in step (2) above.

(6) Remove rivnut (20) from panel by drilling out with a drill having a drill bit the same diameter as the rivnut.

(7) Remove screw (21), washer (22), and remove ground rod (23) from panel.

(8) Remove angle (26) by removing rivets (25).

(9) Remove seal (27) by peeling from cemented area.

(10) Remove closeout (28) per step (2) above.

(11) Remove rivet (29 and 30) and remove tee (31).

(12) Remove bulb and tail seal (32) by peeling from cemented area on tee (31). Remove closeout (33) from panel edge. Remove blind nut (34) from panel.

(13) Remove screw (35) and remove right hand and left hand adapter frames (37 and 38) from panel. Remove rivnut (36) by drilling using same size drill bit as rivnut diameter.

(14) Remove rivet (39) and remove angle (40), closeout (41), angle (42) and closeout (43) from bottom edge of panel.

(15) Remove rivets (29 and 30) to remove upper tee (44). Remove bulb and tail seal (45) by peeling from cemented area.

(16) The removable panel assembly (60) shall be removed from the end panel (46) by removing screws (47), washers (48), lockwashers (49) and pulling panel (60) away from end panel assembly (46).

(17) Remove strap (51) by removing rivets (50).

(18) Remove closeout (52 and 59) per step (2) above.

(19) Remove screw (54), washer (55) and remove ground rod (56). Remove rivnut (53) by

drilling out with a drill having a drill bit the same diameter as the rivnut.

(20) Remove handle assembly (58) by removing rivets (57).

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-4. If possible straighten any bent plates, latches, angles or tees. Repair damaged closeouts per paragraph 8-4.

e. Overhaul. Overhaul the folding end panels as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the folding end panel assemblies using figure 8-5 as a guide and observing the following.

(1) Install blind nuts and rivnuts per manufacturer's recommended procedures.

(2) Replace rivets.

(3) Seal all cracks around hinge edges using sealant EC776, 3M Co., or equivalent.

(4) Cement seals.

g. Installation. Install panel assemblies as follows:

(1) Install the screws (1, fig. 8-5) washers (2) and rivets (3) to secure the hinges to the fixed end panel and the folding side panels and install the folding end panel.

(2) Install the grounding straps between the fixed end panels and folding end panels, and between the folding side panel and the folding end panel.

(3) Engage all latches and hardware to secure the folding end panels to folding floor panel and observing the procedures given on the shelter instruction plate located on the access foor.

8-7. Folding Roof Panel Assemblies Repair

a. General. The folding roof panel assemblies are aluminum faced honeycomb core panels. There are two folding roof panels one on each end of the shelter. The folding roof panels provide for attachment of the conditioned air distribution plenums and conditioned air duct adapters (fig. 8-1).

b. Removal. Remove the folding roof panel assembly as follows..

(1) Disconnect wiring harness assemblies at receptacle boxes as follows:

(*a*) Disconnect harness connectors (13 and 14, FO-3) from receptacle boxes on the shelter ceiling.

(*b*) Remove screws (1, fig. 6-14) and cover plates (2) from receptacle boxes and remove screw (3) and bracket (4). Separate male harness (8) from bracket (4) by removing nut (5), washer (6) and screw (7).

(*c*) Disconnect terminals (1, fig. 6-15) from light assemblies.

(*d*) Pull harness assemblies (13 and 14, FO-3) (located in back of manual) from the electrical wiring raceways.

(2) Disengage all latches which secure the roof to the end and side panels.

(3) Place folding end and folding side panels in the folded position.

(4) Lower folding roof to gain access to the hinge assemblies which secure the folding roof to the fixed roof.

(5) Remove the rivets (1, FO-) (located in back of manual) which secure the retainer strip (2) and seal (3) to the hinge halves and remove the seal (3).

(6) Remove the hinge pin (4) to separate the hinge halves and remove the panel assembly.

c. Disassembly. Disassemble the folding roof panel as required to replace damaged parts using FO-5 (located in back of manual) as a guide and observing the following.

(1) Remove gasket retainers (6, 7, 8 and 9, FO-5) by removing rivets (5). Slide bulb seal (10, detail B) from groove in gasket retainers.

(2) Remove strike assembly (12) by removing bolt (11).

(3) Remove rivet (13) and remove retainer strip (14) and seal (15) from panel edge.

(4) Remove ball lock receptacle (17) by removing rivet (16).

(5) On shelters serial No. 1 thru 184, remove pin (58) and on shelters serial No. 185 thru 302, remove safety pin (66) from pivot assembly (20) and remove support assembly (67).

(6) Remove bolt (18), washer (19) and remove pivot assembly (20) from edge of extrusion (22).

(7) Remove rivet (21) and remove extrusion (22 and 30) from panel edge.

(8) Separate shear angle (27) from extrusion (30) by removing bolt (23), washer (24), bolt (25) and washer (26). Remove rivet (28) to remove spacer (29).

(9) Remove screw (31), washer (32) and ground rod (33) from panel.

(10) Remove fluorescent light assemblies from fiberglass box (38 and 39).

(11) Remove fiberglass box (38 and 39) from roof cut out by sliding a knife or other suitable tool along edges of fiberglass box and panel honeycomb core.

(12) Unfasten latches on flange (46) from strike assembly (44) and remove flange (46).

(13) Remove duct cover (42) by removing rivets (36) from hinge assembly (37). Remove strap (41) from duct cover (42) by removing screw (38) and

washers (39 and 40). Remove strike assembly (44) from duct cover (42) by removing rivets (43). Remove duct cover seal (45) from duct port angle (49) by peeling away from cemented area. Separate angles (49 and 50) by removing rivets (48). Peel gasket (47) away from cemented area on duct port angle (50).

(14) Remove screw (51), washer (52), clamp (53) and spacer (54) from panel.

(15) Remove seal (55) from peeling from cemented area on panel.

(16) Remove mobilizer scuff plate (57) by removing rivets (56).

(17) Disassemble support assembly (67) by removing ball lock pins (59) and (61), cable (60), bolt (62), washers (63), nut (64), and pivot (65). On shelters serial No. 185 thru 302, remove safety pin (66). Slip the support foot half from the pivot half.

d. ***Repair.*** Repair damage to honeycomb panel using procedures outlined below. If possible straighten any bent plates latches angles or extrusions.

WARNING

Adhesives and solvents are highly flammable; perform work in well ventilated area and away from fire.

(1) **Mixing of Two Part Adhesive.** Mixing of adhesive, used for repair of honeycomb core, shall' be accomplished as follows.

(a) Use a mixing ratio of from 50 parts accelerator to 50 parts base by volumne, to 100 parts accelerator to 100 parts base by volume.

(b) Add the proper amount of adhesive base and accelerator to a mixing cup (from repair kit) and mix thoroughly using a mixing paddle from the repair kit. The pot life of the adhesive after mixing is 45 minutes.

(2) **Repairing honeycomb panel with damage to one surface only.** Repair damaged honeycomb panel as follows:

(a) Trim the damaged area of the aluminum facing using tin snips, circular saw or other suitable tool (fig. 8-3).

(b) Trim honeycomb core with a knife to the same size as the trimmed hole in the facing through the entire thickness of the core (fig. 8-3).

NOTE

In general, trimmed holes are not restricted as to size or shape; however, those of rectangular, circular, square and oval and rectangular with round ends usually are more desirable as to appearance and ease of installation.

(c) Clean the interior surface of the undamaged facing with emery cloth, and a clean lint-free cloth soaked with methyl-ethyl-ketone.

(d) Cut a section of honeycomb core material the same size as the trimmed hole using the honeycomb furnished with the repair kit.

(e) Fabricate plug patch plate which will overlap hold opening by approximately 3 inches (8 cm) on all sides using figure 8-3 as a guide.

(f) Drill rivet holes in the patch plate using a number 30 drill (0.128-0.132 inch (0.3251 cm - 0.3353 cm) diameter) and spaced as illustrated in figure 8-3.

(g) Drill matching holes in the panel using the patch plate as a template.

(h) Apply a thin coat of adhesive to the cleaned interior facing (step *(c)* above), the edges of the honeycomb core.

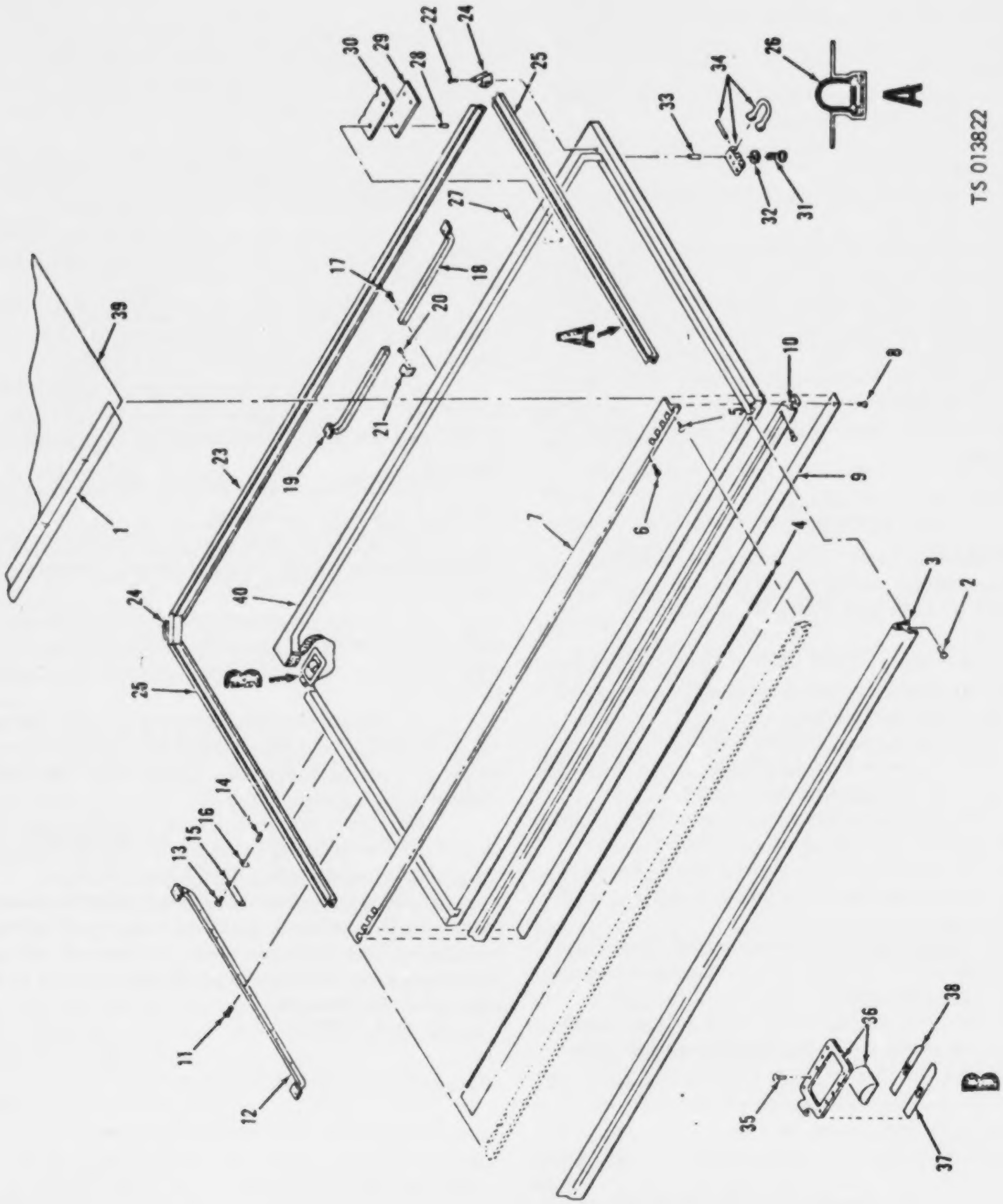
(i) Insert the honeycomb core into the timmed area of the panel and press firmly in place. Fill area above core with adhesive and place plug patch in position.

(j) Secure the patch plate in position using 1/8 inch (0.3175 cm) domed head blind rivets (from repair kit), using procedures given in section XII, chapter 4, as a guide (fig. 8-3).

(k) Apply primer and after primer is dry repaint repair area using paint confoming to Federal Standard 595, Color Chip 34087 (para 8-18).

(3) **Repair to honeycomb panel with damage to both surfaces.** Damage to a panel which penetrates both surfaces shall be repaired using procedure given in paragraph (2) above. Both facings ashall be repaired.

(4) DELETED.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TS 013822

Figure 8-6. Folding Floor Panel Assembly, Disassembly (TS 013822)

1. Mylar tape
2. Rivet (184)
3. Seal
4. Hinge pin
5. Rivet (178)
6. Screw (23)
7. Hinge half
8. Rivet (44)
9. Retainer strip
10. Seal
11. Screw (11)
12. Frame, bellows
13. Screw (4)
14. Insert (4)
15. Bracket (2)
16. Spacer (4)
17. Screw (10)
18. Frame, bellows
19. Frame, bellows
20. Screw (6)
21. Keeper plate (2)
22. Rivet (96)
23. Gasket retainer
24. Gasket retainer (2)
25. Gasket retainer
26. Seal, bulb
27. Insert (4)
28. Insert (4)
29. Doubler
30. Doubler
31. Bolt (6)
32. Washer (6)
33. Insert (6)
34. Ring assembly
35. Rivet (32)
36. Handle assembly
37. Shim
38. Shim
39. * Floor cover
40. Folding floor panel as

Figure 8-6 — Continued.

*Shelter serial No. 1 thru 184 only.

(5) *Repair to damaged honeycomb panel edging (closeouts).* Repair damaged panel edging as follows:

(*a*) Remove the damaged phenolic edging with a sharp knife to cut away from honeycomb core, using care to prevent damage to honeycomb core and aluminum facing edge.

(*b*) Cut a section of phenolic edging the same size as the damaged area and apply a thin coat of the two part adhesive to the phenolic edging back.

(*c*) Press the edging firmly in place and allow to cure for a minimum of 8 hours.

e. Overhaul. Overhaul the folding roof panel assembly as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the folding roof panel using FO-5 (located in back of manual) as a guide and observing the following:

(1) Cement seals.

(2) Cement fiberglass light boxes in position using the two part adhesive from the repair kit and mixing per paragraph 8-7*d*.

g. Installation. Install the folding roof panel assembly using FO-5 (located in back of manual) as a guide and observing the following:

(1) Position the hinge halves together and secure with the hinge pin (4).

(2) Rivet the seal assemblies in place.

(3) Securely fasten all latches to the folding end and side panels.

(4) Reconnect the wiring harness as receptacle boxes.

8-8. Folding-Floor Panel Assemblies

a. General. The folding floor panel assemblies **are aluminum faced honeycomb core panels. On shelter serial No. 1 thru 184 only, the interior face is covered with a nonslip velstat fabric. There are two panel assemblies, one on each side of the shelter** (fig. 8-1).

b. Removal. Remove the folding floor panel assemblies as follows:

(1) Remove the folding end jack assemblies.

(*a*) Unscrew bolt (6, fig. 4-21, sheet 2 of 2) from panel and remove nut (7).

(*b*) Remove bolts (8) from attaching bracket and the four flat head screws (9) from bottom of bracket. Remove jack assembly (10).

(2) Disengage all latches and hardware which secure the folding floor panels to the folding end panels and folding side panels observing the procedures given on the shelter instruction plate located on the door.

(3) Remove the grounding straps between the fixed floor panel and folding floor panels.

(4) Place folding end and side panels in the folded position (para 8-2*b*. through 8-6).

(5) Raise the floor panel to gain access to the hinge which secures the folding floor panel to the fixed floor panel.

(6) Remove Mylar tape (1, fig. 8-6) from hinge joint, and remove rivets (2) which secure the seal (3) to the folding floor and fixed floor panels. Remove hinge pin (4) and remove folding floor panel (40).

c. Disassembly. Disassemble the folding floor panel as required to replace damage using figure 8-6 as a guide and observing the following:

(1) Remove rivet (5, fig. 8-6) and screw (6) to remove hinge half (7) from panel edge. Remove seal (10) by peeling from cemented area.

(2) Remove rivet (8) and retainer strip (9) and remove seal (10) from panel edge.

(3) Remove screw (11) and remove bellows frame (12). Remove screw (13), bracket (15) and spacer (16). Remove insert (14) by drilling using a drill bit with the same diameter as the insert.

(4) Remove bellows frame (18 and 19) by removing screws (17).

(5) Remove keeper plate (21) by removing screws (20).

(6) Remove rivets (22) and remove gasket retainers (23, 24 and 25). Remove bulb seals (26) by sliding from gasket retainer groove (detail A).

(7) Remove inserts (27 and 28) by drilling using a drill bit with the same diameter as the insert, and remove doubler (29 and 30).

(8) Remove bolt (31), washer (32) and ring assembly (34) from panel. Disassemble ring assembly (34) from plate by removing pin. Remove insert (33) from panel by drilling out with a drill bit having the same diameter as the insert.

(9) Remove rivet (35) to remove handle assembly (36) and shims (37 and 38) from panel.

***(10)* Shelter serial No. 1 thru 184 only. Remove velstat floor covering (39) from panel facing by peeling from cemented area.**

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-7*d*. If possible, straighten any bent plates, latches, angles, or extrusions using hammer, pliers vise or other suitable tool.

e. Overhaul. Overhaul the folding floor panel assembly as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the folding roof panel using figure 8-6 as a guide and observing the following:

(1) Cement seals (10, fig. 8-6).

***(2)* Due to discontinuance of explosive or flammable anesthesia, velstat flooring (39) is no longer required. Refer to paragraph 8-18.1 for floor refinishing.**

(3) Replace potted inserts.

(4) Replace bulb seal assemblies (26) by coating bottom edge with one part adhesive from repair kit and sliding into groove in gasket retainers (23, 24 and 25).

(5) Seal all cracks around hinge edges using sealant EC776, 3M Co., or equivalent.

g. Installation. Install the folding floor panel assembly and observing the following:

(1) Position hinge half (7, fig. 8-6) into fixed floor hinge half and insert the hinge pin (4).

(2) Rivet the seal (3) to the folding floor and the fixed floor panels.

(3) Install the adhesive backed Mylar tape (1) to hinge joint. (Mylar tape is supplied with the shelter repair kit).

(4) Replace the grounding straps between the fixed floor panel and the folding floor panel.

(5) Engage all latches which secure the folding floor panel to the folding end and side panels.

Section II. FIXED PANEL ASSEMBLIES

8-9. General

This section provides instructions for replacement of those items considered as part of the fixed panel assemblies. They consist of one door assembly, fixed end jack assemblies, water box fixed end panel, door fixed end panel, fixed floor panel, and fixed roof panel (fig. 8-1).

8-10. Fixed Roof Panel Assembly

a. General. The fixed roof panel assembly is a metal faced honeycomb core panel. The fixed roof panel consists of hinge assemblies, which attach to the folding roof panels, two fluorescent light assemblies, receptacle boxes, and electrical raceways and wiring harness assemblies (fig. 8-1).

b. Removal. Remove the fixed roof assembly as required to replace damaged components using figure 8-7 as a guide and observing the following:

(1) Remove all electrical wiring and harness assemblies from ceiling using procedures outlined in chapter 6, section II.

(2) Remove bolts from ceiling mount flanges on the power distribution box.

(3) Remove hinge pins (4, FO-5) (located in back of manual) from hinge halves (10, fig. 8-7) to disconnect fixed roof panel from folding roof panel using procedure given in paragraph 8-7*b*.

(4) Remove bolt (1), washers (2 and 3) from fixed end panel, leave bolts in fixed roof panel.

(5) Remove bolt (5), washers (6 and 7) and remove gusset assembly (8).

(6) Lift roof assembly up with a hoist, or lift by hand using two or more men. Use lift ring assemblies (4) and handles (28) for attach and handling points.

1. Mylar tape
2. Rivet (184)
3. Seal
4. Hinge pin
5. Rivet (178)
6. Screw (23)
7. Hinge half
8. Rivet (44)
9. Retainer strip
10. Seal
11. Screw (11)
12. Frame, bellows
13. Screw (4)
14. Insert (4)
15. Bracket (2)
16. Spacer (4)
17. Screw (10)
18. Frame, bellows
19. Frame, bellows
20. Screw (6)
21. Keeper plate (2)
22. Rivet (96)
23. Gasket retainer
24. Gasket retainer (2)
25. Gasket retainer
26. Seal, bulb
27. Insert (4)
28. Insert (4)
29. Doubler
30. Doubler
31. Bolt (6)
32. Washer (6)
33. Insert (6)
34. Ring assembly
35. Rivet (32)
36. Handle assembly
37. Shim
38. Shim
* 39. Floor cover
40. Folding floor panel as

Figure 8-6 — Continued.

*Shelter serial No. 1 thru 184 only.

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(5) *Repair to damaged honeycomb panel edging (closeouts).* Repair damaged panel edging as follows:

(*a*) Remove the damaged phenolic edging with a sharp knife to cut away from honeycomb core, using care to prevent damage to honeycomb core and aluminum facing edge.

(*b*) Cut a section of phenolic edging the same size as the damaged area and apply a thin coat of the two part adhesive to the phenolic edging back.

(*c*) Press the edging firmly in place and allow to cure for a minimum of 8 hours.

e. Overhaul. Overhaul the folding roof panel assembly as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the folding roof panel using FO-5 (located in back of manual) as a guide and observing the following:

(1) Cement seals.

(2) Cement fiberglass light boxes in position using the two part adhesive from the repair kit and mixing per paragraph 8-7*d*.

g. Installation. Install the folding roof panel assembly using FO-5 (located in back of manual) as a guide and observing the following:

(1) Position the hinge halves together and secure with the hinge pin (4).

(2) Rivet the seal assemblies in place.

(3) Securely fasten all latches to the folding end and side panels.

(4) Reconnect the wiring harness as receptacle boxes.

8-8. Folding-Floor Panel Assemblies

a. General. The folding floor panel assemblies **are aluminum faced honeycomb core panels. On shelter serial No 1 thru 184 only, the interior face is covered with a nonslip velstat fabric. There are two panel assemblies, one on each side of the shelter (fig. 8-1).**

b. Removal. Remove the folding floor panel assemblies as follows:

(1) Remove the folding end jack assemblies.

(*a*) Unscrew bolt (6, fig. 4-21, sheet 2 of 2) from panel and remove nut (7).

(*b*) Remove bolts (8) from attaching bracket and the four flat head screws (9) from bottom of bracket. Remove jack assembly (10).

(2) Disengage all latches and hardware which secure the folding floor panels to the folding end panels and folding side panels observing the procedures given on the shelter instruction plate located on the door.

(3) Remove the grounding straps between the fixed floor panel and folding floor panels.

(4) Place folding end and side panels in the folded position (para 8-2*b*. through 8-6).

(5) Raise the floor panel to gain access to the hinge which secures the folding floor panel to the fixed floor panel.

(6) Remove Mylar tape (1, fig. 8-6) from hinge joint, and remove rivets (2) which secure the seal (3) to the folding floor and fixed floor panels. Remove hinge pin (4) and remove folding floor panel (40).

c. Disassembly. Disassemble the folding floor panel as required to replace damage using figure 8-6 as a guide and observing the following:

(1) Remove rivet (5, fig. 8-6) and screw (6) to remove hinge half (7) from panel edge. Remove seal (10) by peeling from cemented area.

(2) Remove rivet (8) and retainer strip (9) and remove seal (10) from panel edge.

(3) Remove screw (11) and remove bellows frame (12). Remove screw (13), bracket (15) and spacer (16). Remove insert (14) by drilling using a drill bit with the same diameter as the insert.

(4) Remove bellows frame (18 and 19) by removing screws (17).

(5) Remove keeper plate (21) by removing screws (20).

(6) Remove rivets (22) and remove gasket retainers (23, 24 and 25). Remove bulb seals (26) by sliding from gasket retainer groove (detail A).

(7) Remove inserts (27 and 28) by drilling using a drill bit with the same diameter as the insert, and remove doubler (29 and 30).

(8) Remove bolt (31), washer (32) and ring assembly (34) from panel. Disassemble ring assembly (34) from plate by removing pin. Remove insert (33) from panel by drilling out with a drill bit having the same diameter as the insert.

(9) Remove rivet (35) to remove handle assembly (36) and shims (37 and 38) from panel.

(10) Shelter serial No. 1 thru 184 only. Remove velstat floor covering (39) from panel facing by peeling from cemented area.

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-7*d*. If possible, straighten any bent plates, latches, angles, or extrusions using hammer, pliers, vise or other suitable tool.

e. Overhaul. Overhaul the folding floor panel assembly as required to return to a serviceable condition per chapter 8, section III.

f. Assembly. Assemble the folding roof panel using figure 8-6 as a guide and observing the following:

(1) Cement seals (10, fig. 8-6).

(2) Due to discontinuance of explosive or flammable anesthesia, velstat flooring (39) is no longer required. Refer to paragraph 8-18.1 for floor refinishing.

(3) Replace potted inserts.

(4) Replace bulb seal assemblies (26) by coating bottom edge with one part adhesive from repair kit and sliding into groove in gasket retainers (23, 24 and 25).

(5) Seal all cracks around hinge edges using sealant EC776, 3M Co., or equivalent.

g. Installation. Install the folding floor panel assembly and observing the following:

(1) Position hinge half (7, fig. 8-6) into fixed floor hinge half and insert the hinge pin (4).

(2) Rivet the seal (3) to the folding floor and the fixed floor panels.

(3) Install the adhesive backed Mylar tape (1) to hinge joint. (Mylar tape is supplied with the shelter repair kit).

(4) Replace the grounding straps between the fixed floor panel and the folding floor panel.

(5) Engage all latches which secure the folding floor panel to the folding end and side panels.

Section II. FIXED PANEL ASSEMBLIES

8-9. General

This section provides instructions for replacement of those items considered as part of the fixed panel assemblies. They consist of one door assembly, fixed end jack assemblies, water box fixed end panel, door fixed end panel, fixed floor panel, and fixed roof panel (fig. 8-1).

8-10. Fixed Roof Panel Assembly

a. General. The fixed roof panel assembly is a metal faced honeycomb core panel. The fixed roof panel consists of hinge assemblies, which attach to the folding roof panels, two fluorescent light assemblies, receptacle boxes, and electrical raceways and wiring harness assemblies (fig. 8-1).

b. Removal. Remove the fixed roof assembly as required to replace damaged components using figure 8-7 as a guide and observing the following:

(1) Remove all electrical wiring and harness assemblies from ceiling using procedures outlined in chapter 6, section II.

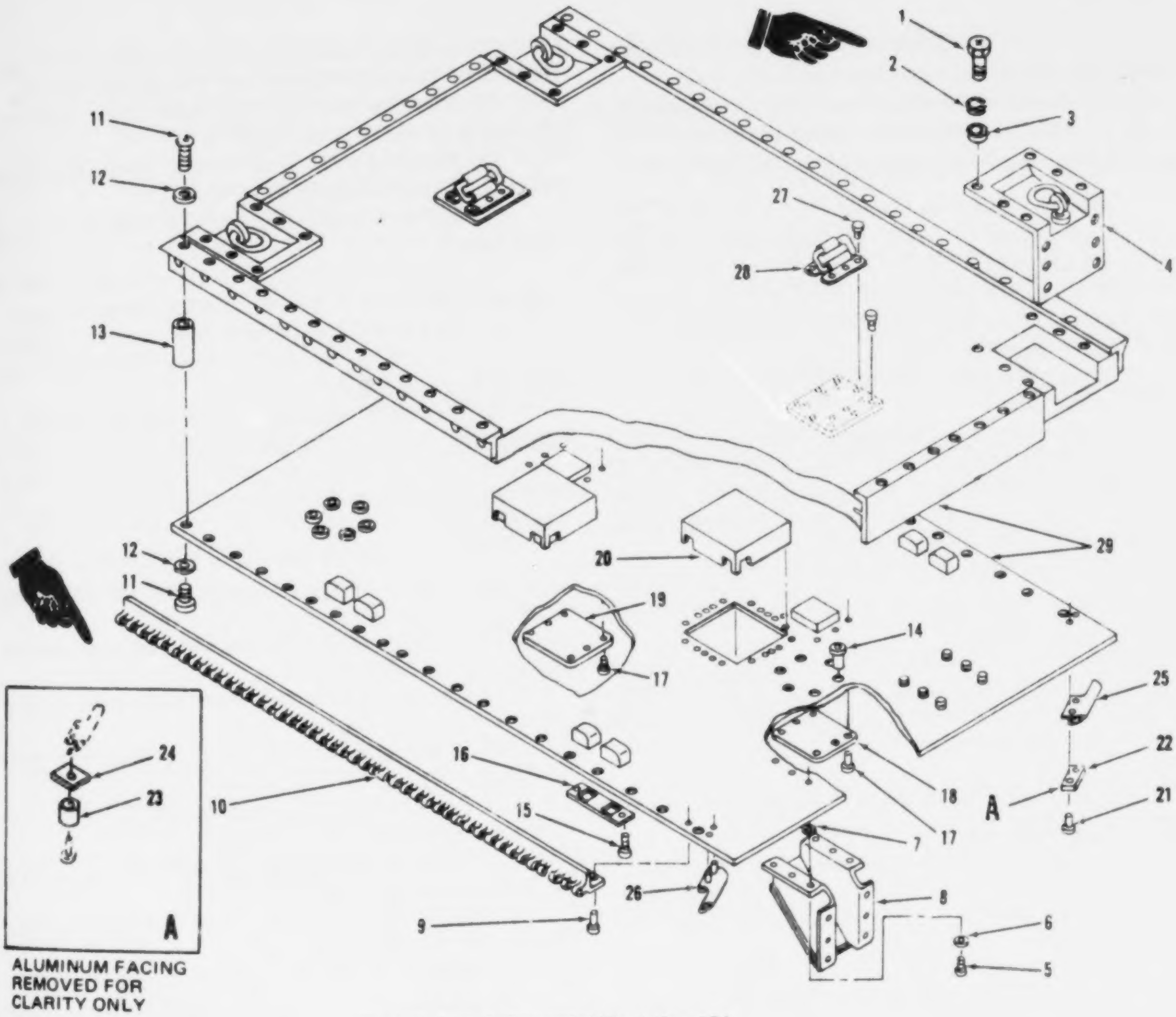
(2) Remove bolts from ceiling mount flanges on the power distribution box.

(3) Remove hinge pins (4, FO-5) (located in back of manual) from hinge halves (10, fig. 8-7) to disconnect fixed roof panel from folding roof panel using procedure given in paragraph 8-7*b*.

(4) Remove bolt (1), washers (2 and 3) from fixed end panel, leave bolts in fixed roof panel.

(5) Remove bolt (5), washers (6 and 7) and remove gusset assembly (8).

(6) Lift roof assembly up with a hoist, or lift by hand using two or more men. Use lift ring assemblies (4) and handles (28) for attach and handling points.



*Installed on shelter serial No. 1 thru 184

**Installed on shelter serial No. 185 thru 302

TS 013823

1. Bolt (48)
2. Washer (48)
3. Washer (48)
4. Lift ring assembly (4)
5. Bolt (48)
6. Washer (48)
7. Washer (48)
8. Gusset assembly (4)
9. Rivet (178)
10. Hinge half
11. Screw (2)
12. Washer (2)
13. Ground rod
14. Insert, surgical light attach (18)
15. Screw (16)
16. Cover, outlet box (4)
17. Screw (16)
18. Cover, conduit box
19. Cover, conduit box
20. Box, fiberglass

*21. Rivet (8)

**21. Rivet (4)

*22. Plate (4)

**23. Spacer (4)

**24. Square washer (4)

25. Extrusion, R. H. (2)
26. Extrusion, L. H. (2)
27. Rivet (6)
28. Handle
29. Panel, fixed roof

Figure 8-7. Fixed Roof Panel Assembly, Disassembly (TS 013823)

c. *Disassembly.* Disassemble fixed roof panel as required to replace damaged parts using figure 8-7 as a guide and observing the following:

(1) Remove bolts (1, fig. 8-7), washers (2 and 3) and remove lift ring assembly (4) from roof panel.

(2) Remove hinge half (10) by removing rivet (9).

(3) Remove screw (11), washer (12) and remove ground rod (13) from panel.

(4) Remove surgical light inserts (14) by drilling out with a drill bit having the same diameter as the insert.

(5) Remove outlet box cover (16) from fixed roof panel (29) by removing screws (15).

(6) Remove conduit box covers (18 and 19) from panel (29) by removing screws (17).

(7) Remove fiberglass box (20) by running a knife or other suitable tool around edges of box to cut adhesive bond and separate box (20) from panel core.

(8) On shelter serial No. 1 thru 184 only: remove extrusions (25 and 26) from panel by removing rivets (21) and plate (22). On shelter serial No. 185 thru 302 only: remove extrusions (25 and 26) from panel by removing rivets (21), spacer (23), and square washers (24).

(9) Remove rivet (27) and remove handle (28) from panel (29).

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-7*d*. If possible, straighten any bent plates latches, angles or extrusions using a hammer, vise, or other tool to restore to a serviceable condition.

e. Overhaul. Overhaul the folding roof assembly as required to return to a serviceable condition (chap. 8, Sec. III).

f. Assembly. Assemble the fixed roof panel using figure 8-7 as a guide and observing the following:

(1) Cement fiberglass light boxes (21, fig. 8-7) in position using the two part adhesive from repair kit.

(2) Seal all cracks around hinge edges using sealant, EC776, 3M Co., or equivalent.

(3) Replace inserts in panel.

g. Installation. Install the fixed roof panel assembly using figure 8-7 as a guide and observing the following:

(1) Lower roof assembly into proper position assuring that all gusset and lift ring bolt holes in panel align with those in fixed end panels.

(2) Secure fixed roof panel by placing gusset (8, fig. 8-7) into position and securing with holes (5) and washers (6 and 7). Replace bolts (1) and washers (2 and 3) into end panel portion of lift ring assembly (4) and tighten securely.

(3) Replace bolts into the ceiling mount flanges on the distribution box and tighten securely.

(4) Replace hinge pins and seal assemblies (para 8-7*b*).

(5) Remove fixed end jack assemblies.

(6) Replace all electrical wiring in roof panel (chap. 6, sec. II).

8-11. Door Fixed End Panel Assembly

a. General. The door fixed end panel assembly is a metal faced honeycomb core panel which houses the access door assembly.

b. Removal. Remove the door fixed end panel as required to replace damaged components using FO-6 (located in back of manual) as a guide and observing the following:

(1) Remove gusset assembly from fixed roof and door fixed end panel per paragraph 8-10*b*.

(2) Remove distribution box from wall per paragraph 6-29*b* and figure 6-7.

(3) Remove electrical wiring from door fixed end panel per chapter 6, section II.

(4) Remove grounding straps from door fixed end panel.

(5) Remove rivets (1, FO-6) (located in back of manual) and angle (2) from bottom edge of panel.

(6) Remove hinges from door fixed end panel per paragraph 8-6*b*. and remove door fixed end panel from shelter.

c. Disassembly. Disassemble the door fixed panel assembly as required to replace damaged parts according to sequence of index numbers assigned to FO-6 (located at back of manual) and observing the following:

(1) Remove latch assembly (4, FO-6) by removing screw (3). Remove screw (5) and remove shear plate (6).

(2) Remove bolt (7), washer (8) and remove mobilizer bracket (9).

(3) Remove electrical raceway cover (11) by removing rivets (10).

(4) Remove rivet (12) and remove the level indicators (13) from end panel.

(5) Remove rivets (14) and instruction plate (15) from access door.

(6) Remove rivets (16) and identification plate (17) from end panel.

(7) Remove rivets (18) and remove doubler plate (19) from panel.

(8) Remove gutter (21) by removing rivets (20).

(9) Remove outlet panel assembly (25), from shelter end panel by removing screws (22) and washers (23 and 24).

(10) Remove screws (26), cover (27) and receptacle box (28) from panel.

(11) Remove screws (29), cover (30) and switch box (31) from panel.

(12) Remove sterilizer vent (32) and cap (33) by pushing from outside facing of panel with a fiber or soft metal punch.

(13) Remove seal (34) from bottom opening in edge extrusion.

(14) Remove seal (35) by peeling from cemented area.

(15) Remove nut (36), screw (37), and screw (38). Remove brace (39). Remove bolt (40) and remove doubler (41) and angle (42).

(16) Remove handbook container (45) from door assembly by removing rivet (44).

(17) Remove rivet (46), hinge (47) and spacer (48). Remove door assembly from end panel.

(18) Remove rivets (49 and 50) and remove tees (51 and 53) from door. Remove seals (52 and 54) from tees (51 and 53) by peeling from cemented areas.

(19) Remove rivets (57) and remove angles (58 and 59) from door edge. Remove closeouts (55 and 56) from edge of door by running a knife or other suitable tool between closeout and door edge.

(20) Remove doubler (61) from door by removing rivet (60).

(21) Remove nut (62) and screw (63); remove the door lock assembly from door and disassemble observing detail A and the following.

(*a*) Remove screw (64), handle bar (65). Remove screw (66) and remove handle bail (67) from lock. Remove spacer (69) from handle bail (67) and remove plate (68).

(*b*) R.Epve lee-er (70) and stop arm (71). Remove screw (72) and remove idler block (73), stop arm (74), keeper (75) and locking blade (76).

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-7*d*. If possible, straighten any bent plates, latches, angles, or extrusions using pliers, hammer, vise or other suitable tool.

e. Overhaul. Overhaul the door fixed end panel assembly as required to return to a serviceable condition (chap. 8, sec. III).

f. Assembly. Assemble the door fixed end panel using FO-6 (located in back of manual) as a guide and observing the following:

(1) Cement all seals in position using the one part adhesive from the repair kit. Clean all old adhesive residue from the bonding area using an approved cleaning solvent.

(2) Replace all rivets.

(3) Seal all cracks around hinge edges using EC 776, 3M Co., or equivalent.

g. Installation. Install the door fixed end panel using FO-6 (located in back of manual) as a guide and observing the following:

(1) Position fixed end panel on the shelter and secure hinges per paragraph 8-6*g*.

(2) Install angle (2, FO-6) (located in back of manual) and secure with rivets (1).

(3) Install ground straps between fixed end and folding end panel assemblies.

(4) Replace electrical wiring in door fixed end panel per chapter 6, section II.

(5) Install distribution box assembly per paragraph 6-29.

(6) Install gusset assembly and secure with bolts and washers per paragraph 8-10*g*.

8-12. Water Box Assembly

a. General. The water box assembly is a metal faced honeycomb core box assembly housing water system and electrical system components.

b. Disassembly. Disassemble the water box assembly as required to replace damaged components according to sequence of index numbers assigned to figure 8-8 and observing the following:

(1) Remove all plumbing system components per paragraphs 4-40 and 10-5.

(2) Remove electrical system components as outlined in chapter 6, section II.

(3) Remove screw (1, fig. 8-8), washer (2) and remove cover assembly (3).

(4) Separate hinge (5) from cover assembly (3) by removing rivet (4). Remove seals (6, 7 and 8) by peeling from cemented area.

(5) Remove rivets (9), door assembly (10) and remove seals (11, 12, 13 and 14) by peeling from cemented area.

(6) Remove rivet (15), door assembly (16) and remove seals (17, 18, 19 and 20) by peeling from cemented area.

(7) Remove pin (21) and remove fastener stud (22) from cover assembly (3).

(8) Remove rivet (23) and remove cover assembly (24). Remove hinge (26) by removing rivet (25).

(9) Remove pin (27) and remove fastener stud (28) from cover assembly (24). Remove rivet (29) and remove receptacle (30).

(10) Remove seals (31) and insulation (32) by peeling from cemented area.

(11) Remove bolts (33), washers (34) and remove receptacles mounting bracket (35).

(12) Remove bolts (36), washers (37) and remove receptacle mounting bracket (38).

(13) Remove rivet (39) to remove receptacle (40) from bracket (38). Remove rivet (41) and nut plate (42).

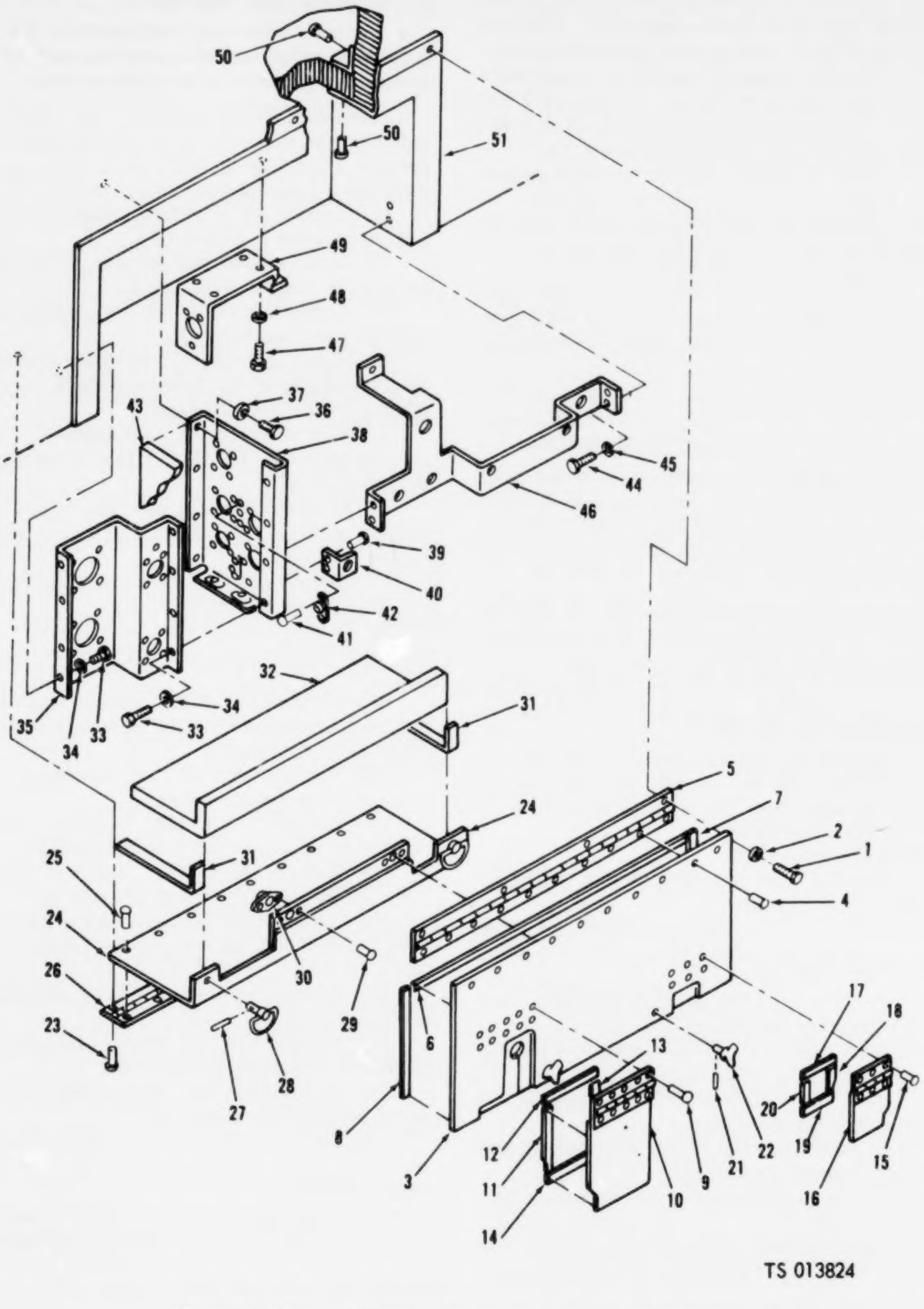
(14) Remove insulation (43) by peeling from cemented area.

(15) Remove bolt (44), washer (45) and remove disconnect mounting bracket (46).

(16) Remove bolt (47), washer (48) and remove pump mounting bracket (49).

(17) Remove water box (51) from shelter by removing rivets (50) from angles on interior and exterior of box.

c. Assembly. Assemble water box assembly using figure 8-8 as a guide and observing the following: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TS 013824

Figure 8-8. Water and Electrical Box Assembly - Disassembly (TS 013824)

1. Screw (4)
2. Washer (4)
3. Cover ay
4. Rivet (10)
5. Hinge
6. Seal
7. Seal
8. Seal
9. Rivet (5)
10. Door ay
11. Seal
12. Seal
13. Seal
14. Seal
15. Rivet (3)
16. Door ay
17. Seal
18. Seal
19. Seal
20. Seal
21. Pin
22. Fastener stud
23. Rivet (8)
24. Cover ay
25. Rivet
26. Hinge
27. Pin (2)
28. Fastener stud (2)
29. Rivet (1)
30. Receptacle (2)
31. Seal
32. Insulation
33. Bolt (8)
34. Washer (8)
35. Bracket, receptacle mtg
36. Bolt (8)
37. Washer (8)
38. Bracket, receptacle mtg
39. Rivet (2)
40. Receptacle
41. Rivet (20)
42. Nut plate (10)
43. Insulation
44. Bolt (5)
45. Washer (5)
46. Bracket, disconnect mtg
47. Bolt (4)
48. Washer (4)
49. Bracket, pump mtg
50. Rivet (29)
51. Water box ay

Figure 8-8 — Continued.

(1) Install water box (51, fig. 8-8) to shelter by installing rivets (50) to angles on interior and exterior of box.

(2) Install bolt (47), washer (48) and install pump mounting bracket (49).

(3) Install bolt (44), washer (45) and install disconnect mounting bracket (46).

(4) Install insulation (43) to cemented area.

(5) Install rivet (41) and nut plate (42). Install rivet (39) to install receptacle (40) to bracket (38).

(6) Install bolts (36), washers (37) and install receptacle mounting bracket (38).

(7) Install bolts (33), washers (34) and install receptacles mounting bracket (35).

(8) Install seals (31) and insulation to cemented area.

(9) Install rivet (29) and install receptacle (30). Install pin (27) and install fastener stud (28) to cover assembly (24).

(10) Install hinge (26) by installing rivet (25). Install rivet (23) and install cover assembly (24).

(11) Install pin (21) and install fastener stud (22) to cover assembly (3).

(12) Install rivet (15), door assembly (16) and install seals (17, 18, 19 and 20) to cemented area.

(13) Install rivets (9), door assembly (10) and install seals (11, 12, 13 and 14) to cemented area.

(14) Install hinge (5) to cover assembly (3) by installing rivet (4). Install seals (6, 7, and 8) to cemented area.

(15) Install screw (1, fig. 8-8), washer (2) and install cover assembly.

(16) Install electrical system components as outlined in chapter 6, section II.

(17) Install all plumbing system components per paragraphs 4-40 and 10-5.

d. Repair. Repair damage to honeycomb panel using procedure outlined in paragraph 8-7*d*. If possible straighten any bent or dented brackets, or hinges using a hammer, pliers, vise, or other suitable tool.

8-13. Water Box Fixed End Panel Assembly

a. General. The water box fixed end panel is a metal faced honeycomb core panel housing the water box assembly at the bottom edge of the panel (fig. 8-1).

b. Removal.

(1) Remove gusset assembly from end panel and roof panel per paragraph 8-10*b*.

(2) Remove hinge half from water box fixed panel per paragraph 8-6*b*.

(3) Remove electrical wiring assembly per chapter 6, section II.

(4) Remove rivets (1, FO-7) (located at back of manual) and move angles (2 and 3) from bottom edge of panel, and remove water box fixed end panel from shelter.

c. Disassembly. Disassemble water box fixed end panel assembly as required to replace damaged parts according to sequence of index numbers assigned to FO-7 (located in back of manual) and observing the following:

(1) Remove screw (4, FO-7) and cover (5) from receptacle box (8). Remove rivet (6) and remove grounding angle (7) and remove receptacle box (8) from panel.

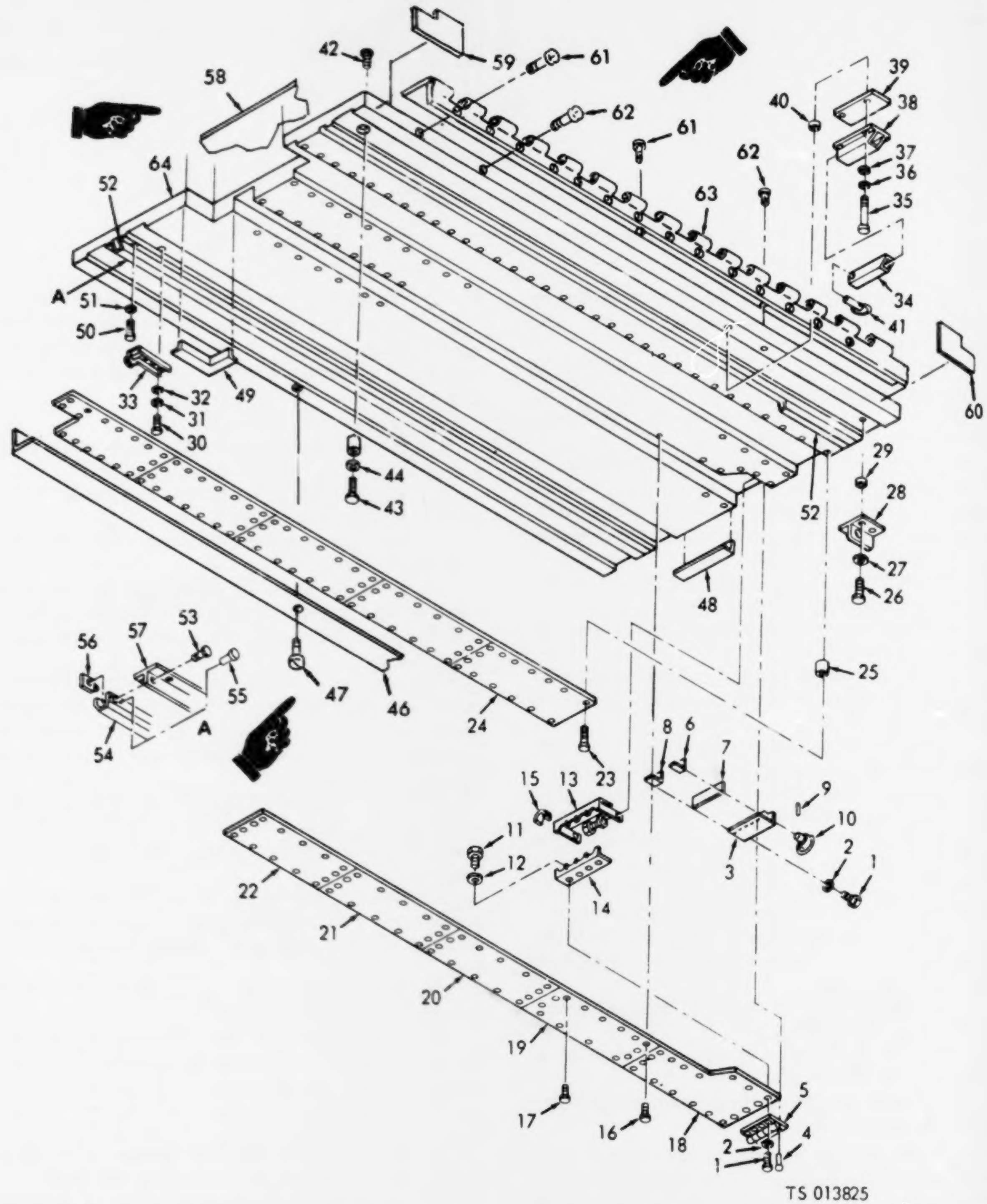
(2) Remove screw, (4), cover (9) and remove receptacle box (10) from panel by running a knife or other suitable tool around edge to separate from core.

(3) Remove screw (11), washer (12) and remove ground rod (13) from panel.

(4) Remove cover (16) by removing screw (14). Remove rivet (17) and grounding angle (18) from receptacle box (19). Remove rivnut (15) by drilling out using a drill bit with the same diameter as the rivnut. Remove box (19) per step (2) above.

(5) Remove screw (20) and remove cover (21), remove box (22) from panel per step (2) above.

(6) Remove seal (23) from opening at bottom of extrusion. Remove seal (24) by peeling from cemented area.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TS 013825

Figure 8-9. Fixed Floor Panel Assembly-Disassembly (TS 013825)

1. Bolt (5)
2. Washer (5)
3. Cover ay
4. Rivet (5)
5. Hinge
6. Gasket
7. Gasket
8. Gasket
9. Pin
10. Fastener stud
11. Bolt (13)
12. Washer (13)
13. Bulkhead ay
14. Bulkhead ay
15. Seal
16. Screw (58)
17. Screw (12)
18. Cover ay
19. Cover ay
20. Cover ay
21. Cover ay
22. Cover ay
23. Screw (24)
24. Cover ay
25. Rivnut (16)
26. Screw (6)
27. Washer (6)
28. Towing bracket (4)
29. Blind nut (6)
30. Screw (6)
31. Washer (6)
32. Washer (6)
33. Mobilizer bracket (4)
34. Channel insert
35. Bolt (8)
36. Washer (8)
37. Washer (8)
38. Support ay
39. Spacer
40. Blind nut
41. Detent pin
42. Screw
43. Screw
44. Washer
45. Ground rod
46. Rivet (1)
47. Seal angle (2)
48. Guard
49. Guard
50. Bolt (38)
51. Washer (38)
52. Skid ay (2)
53. Bolt (22)
54. Channel (2)
55. Rivet (14)
56. Nut plate (22)
57. Extrusion (4, 2 per ay)
58. Panel ay, fixed floor
*58. Floor covering
*59. Seal (2)
**60. Seal (2)
61. Screw (54)
62. Rivet (158)
63. Hinge half (2)
64. Panel ay, fixed floor

*Installed on shelter No. 1 thru 184 only.
**Instalied on shelter serial No. 185 thru 302 only.

Figure 8-9 — Continued.

(7) Remove ring assembly (28 and 29) from panel by removing bolt (25), washers (26 and 27). Separate fitting (33) from ring assembly (28 and 29) by removing screws (30) and washers (31 and 32).

(8) Remove plate (35) by removing rivets (34).

(9) Remove steps (38) by removing bolt (36) and washer (37).

(10) Remove striker plate (41) by removing screw (39). Remove insert (40) by drilling out using a drill bit with the same diameter as the insert.

(11) Remove bracket (45) and spacer (44) by removing bolt (42) and washer (43).

(12) Remove latch assembly (47) by removing screw (46).

(13) Remove screw (48), washer (49) and remove clamp assembly (50). Remove cable assembly (51) and remove lockwire and unscrew hook (52) from turnbuckle (53). Unscrew turnbuckle (53) from terminal (54).

(14) Remove screw (55) and remove capstan (56) from panel.

(15) Remove screw (57), washer (58) and remove spacer (59). Remove insert (60) by drilling out using a drill bit with same size diameter as insert.

(16) Remove tie down assembly (62) by removing rivet (61).

(17) Remove spacer (64) by removing screw (63).

(18) Remove bolt (65), washers (66 and 67) and remove guide assembly (68) from fixed end panel (69).

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-7*d*. If possible, straighten any bent plates, latches, angles, or extrusions using hammer, pliers, vise or other suitable tool.

e. Overhaul. Overhaul the water box fixed end panel assembly as required to return to a serviceable condition (chap. 8, sec. III).

f. Assembly. Assemble the folding roof panel in reverse order of disassembly using FO-7 (located in back of manual) as a guide and observing the following:

(1) Cement seals.

(2) Cement receptacles boxes in position using the two part adhesive from the repair kit.

g. Installation. Install the water box fixed end panel in reverse order of removal using FO-7 (located in back of manual) as a guide.

8-14. Fixed Floor Panel Assembly

a. General. The fixed floor panel assembly is a metal faced honeycomb core panel housing the shelter water tunnel and electrical raceway. It provides mounting for the shelter skid assembly. On shelter serial No. 1 thru 184 only, the interior face is covered with a nonslip velstat fabric (fig. 8-1).

b. Removal. Remove the fixed floor panel assembly as required to replace damaged parts as follows.

(1) Remove fixed end panels, fixed roof panels and water box assembly according to procedures outlined in paragraphs 8-11*b*., 8-13*b*. and 8-12*c*.

(2) Remove hinge pins from hinge halves and remove seals per paragraph 8-7*b*.

NOTE

Block up folding portion of shelter after removal from fixed portion to prevent any possible damage to panel assemblies.

c. Disassembly. Disassemble the fixed floor panel assembly as required to replace damaged part according to sequence of index numbers assigned to figure 8-9 and observing the following:

(1) Remove cover assembly (3, fig. 8-9) by removing bolt (1) and washers (2). Remove hinge (5) from cover (3) by removing rivets (4). Remove gasket (6, 7 and 8) from cover assembly (3) by peeling from cemented area. Remove pin (9) and remove fastener stud (10) from cover assembly (3).

(2) Remove bolt (11) and washer (12) to remove bulkhead assembly (13 and 14). Separate bulkhead (13) from bulkhead (14) by removing screw (17). Remove seal (15) from bulkhead assemblies (13 and 14).

(3) Remove screws (16 and 17) and remove water tunnel cover assemblies (18, 19, 20, 21 and 22).

(4) Remove screws (23) and remove electrical raceway cover assembly (24). Remove rivnut (25) by drilling out using a drill bit having the same diameter as the rivnut.

(5) Remove towing bracket (28) by removing screws (26) and washers (27). Remove blind nut (29) by drilling using a drill bit having the same diameter as the blind nut.

(6) Remove mobilizer bracket (33) by removing screws (30) and washers (31 and 32).

(7) Remove support assembly (38) by removing bolt (35) and washers (36 and 37). Remove spacer (39), separate channel insert (34) from support assembly (38) by removing detent pin (41).

(8) Remove screw (42), screw (43) and washer (44) to remove ground rod (45).

(9) Remove rivet (46) and remove seal angle (47) from edge of panel.

(10) Remove rubber guards (48 and 49) by peeling from cemented area.

(11) Remove bolt (50), washer (51) and remove skid assembly (52). Disassemble skid assembly (52) by removing bolt (53) to separate channel (54) from extrusion (57). Remove nut plate (56) by removing rivet (55).

(12) Shelter serial No. 1 thru 184 only. Remove velstat floor covering (58) from panel by peeling from cemented area.

(13) Shelter serial No. 185 thru 302 only. Remove seals (59 and 60) from panel edge by peeling from cemented area.

(14) Remove hinge half (63) by removing screw (61) and rivet (62).

d. Repair. Repair damage to honeycomb panel using procedures outlined in paragraph 8-7*d*. If possible, straighten any bent plates, latches, angles, or extrusions. **Refer to paragraph 8-18.1 for floor refinishing.**

e. Overhaul. Overhaul the fixed floor panel assembly as required to return to a serviceable condition (chap. 8, sec. III).

f. Assembly. Assemble the fixed floor panel using figure 8-9 as a guide and observing the following.

(1) Cement guards (48 and 49, fig. 8-9).

(2) Replace inserts (para 4-48).

(3) Replace rivets (para 4-47).

(4) Replace rivnuts and blind nuts by methods used in para. *c*., above.

g. Installation. Install the fixed floor panel using figure 8-9 as a guide and observing procedures outlined for replacement of fixed end and fixed roof panel assemblies in paragraphs 8-11, 8-12, and 8-13.

Section III. SHELTER BODY ASSEMBLY OVERHAUL

8-15. General

This section provides information necessary for the overhaul of shelter body assembly. Seal assemblies are to be removed and replaced on a yearly basis. The shelter interior and exterior shall be painted on a yearly basis.

8-16. Panel Assemblies Overhaul

Overhaul of the panel assemblies shall consist of a complete inspection for corrosion, dents, scratches, nicks, or other surface irregularities. Use emery cloth to dress to a smooth surface all nicks, cuts, corrosion and scratches. Minor dents are acceptable. Cuts through the aluminum facing or large dents shall be repaired in accordance with paragraph 8-7*d*.

8-17. Seal Replacement

Replace seal assemblies as outlined in panel disassembly paragraphs, sections I and II, chapter 8.

8-18. Shelter Painting

a. General. This procedure defines the surface preparation, type of primer, paint, and colors to be used on all surfaces to be painted.

b. Surface Preparation. The surface preparation shall be in accordance with MIL-T-704.

c. Exterior Surfaces. Exterior surfaces and components shall be primed with one coat Epoxy Primer, or equivalent (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Apply two finish coats of Specification* TT-E-527 enamel (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Color match per Federal Standard 595 No. 34087.

d. Interior Surfaces. Interior walls shall be primed with one coat of Epoxy Primer, or equivalent (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Apply two finish coats Epoxy Base, Semi-Gloss Green (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to

300°F. (66°C. to 149°C.). Color match per Federal Standard 595 No. 24516.

e. Interior Ceiling. Interior ceiling shall be primed with one coat of Epoxy Primer, or equivalent (catalyze per manufacturer's instructions). Air dry 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Apply two finish coats Epoxy Base, Semi-Gloss Green, or equivalent (catalyze per manufacturer's instructions). Air dry 18 hours or 30 at 150° to 300°F. (66°C. to 149°C.). Color match per Federal Standard 595 No. 24554.

f. Quality Control Requirements.

(1) A sufficient number of parts shall be examined to assure acceptable quality of finishing on all parts. In general, the criteria listed in steps (2) and (3) shall be evaluated. Properties or performance characteristics other than those shown below may be required by applicable drawings or other authoritative documents.

(2) The finish in all types shall show no visual indication of alligatoring, blistering, chalking, checking, cracking, crawling, flaking, lifting, peeling, or sealing. The finish shall exhibit no sags, runs, skips, shading, dusting, or dry overspray.

(3) Adhesion test shall be conducted on finished parts at regular intervals. The tests shall be conducted on a sufficient number of parts selected at random to assure maintenance of a satisfactory level of adhesion on all parts. In performing this test, it is suggested that a plastic or wood stylus be used to scratch the paint films. A metal stylus may be used, but extreme care must be exercised to avoid damaging the basic surface of the part. Several parallel scratches shall be made approximately one-sixteenth inch (0.1588 cm) apart. Apply a one inch (2.54 cm) wide strip of tape, adhesive side down over the scratches. Only newly manufactured tape less than six months old shall be used. Press the tape down with a firm pressure of the hand. Remove the tape in one abrupt action and examine the tested area for any paint damage such as removal of paint at one of the layers of the finishing system or removal of the entire system from the surface. Test panels may be used.

(4) Touch-up after test. Areas which have been used for testing shall be refinished to equal as nearly as possible the original finish requirement. The color of touched up areas shall be reasonably close to that of the surrounding area.

8-18.1. Shelter Floor Refinishing

a. General. **This procedure defines the surface preparation, type of primer and floor finish to be used.**

NOTE

If aluminum facing or honeycomb core is damaged, repair using procedures given in paragraph 8-7d (2) steps (a) through (d) (h) and (i). Do not install doubler plate in order to assure a smooth surface.

b. Surface preparation. **On shelters serial No. 1 thru 184 having velstat covering, prepare damaged or worn surface as follows:**

(1) With a sharp knife cut a square area from damaged or worn section.

(2) Peel away damaged velstat covering.

(3) Thoroughly clean the repair area with emery cloth and a clean, lint-free cloth soaked in methyl-ethyl-keton.

(4) On shelters not having velstat covering, prepare the surface in accordance with MIL-T-704.

NOTE

Application of primer and paint shall be in accordance with manufacturer's recommended instructions stamped on the container.

c. Application.

(1) Apply primer (Products Research Corp. Part No. PRC19).

(2) Apply rubber coating (Products Research Corp. Part No. PRC480) following manufacturer's instructions.

CAUTION

Do not apply primer on rubber coating over moving parts of hinges.

(3) Zurock Inc. primer, Part No. SS516 and floor coating, urethane, gray, zurathread, Part No. SS516 may be used as an alternate for the rubber finish.

8-19. Shelter Air Leakage Test

a. General. The shelter shall be tested on a yearly basis for air leakage to determine correct installation and integrity of the seal assemblies.

b. Test Procedure.

(1) Apply an internal pressure of 0.4 inches (1.016 cm) of water (gage) to the shelter using a barometer or other suitable pressure gage to determine pressure level.

(2) Leakage from the shelter shall not exceed 60 standard cubic feet per minute.

c. Repair. If test in step *b.* above is unsatisfactory make the following checks and correct if required.

(1) Inspect for loose window assemblies on doors. Replace or repair as required.

(2) Inspect water inlet, drain, and vacuum lines where they enter shelter for damaged or missing potting compound. Repot if required using RTV rubber, or equivalent.

(3) Check seal assemblies around doors for leakage, and reposition or replace as required.

(4) Check panel assemblies seals for proper installation or damage. Repair or replace as required.

(5) Check seals on removable panel assemblies for damage or improper installation. Replace or repair as required.

CHAPTER 9

REPAIR OF SHELTER ACCESSORIES

Section I. AIR LOCK CHAMBER

9-1. General

This section provides instructions for repair and replacement of components of the air lock chamber. They consist of bow assemblies, door assembly, and fabric body assembly (fig. 9-1).

9-2. Bow Assemblies

a. General. The bow assemblies provide support for the air lock chamber fabric body assembly. They consist of two metal bows joined with a metal support bar which is riveted to one bow and secured to the other bow with a removable pin (fig. 9-1).

b. Removal. Remove bow assemblies (items 1 through 8, fig. 9-1) as described below.

(1) Remove light assembly from air lock chamber.

(2) Disconnect air lock chamber guy line ropes (2, 4, fig. 9-2) from cable assemblies (3).

NOTE

Remove tent pins (6) used to secure air lock chamber ground apron. Remove cable assemblies if replacement chamber is not to be installed at the same location.

(3) Open and disengage zipper between air lock chamber (8) and chamber adapter.

(4) Lift upon bow assemblies (1 through 8, fig. 9-1) to free bow assemblies from bow spikes (7, fig. 9-2). Remove bow spikes from ground. Remove air lock chamber (8).

c. Disassembly. Disassemble bow assemblies as required for replacement of damaged parts as described below.

(1) Remove retaining pin (1, fig. 9-1) to separate bows (8).

(2) Remove rivet (3) to separate bow support (5).

d. Repair. Repair bow assemblies as required to return to a serviceable condition as follows:

(1) Inspect bow assemblies for dents, misalinement, nicks, and scratches. Minor dents are acceptable as long as function or fit is not affected. Dress all nicks, and scratches with emery cloth assuring that enough wall thickness of the tube remains to assure sufficient strength. If possible, straighten bent or misaligned bow assemblies using a one inch (2.54 cm) conduit tube bending tool or by inserting a tube or pipe inside, or over the bow assembly ends to use as leverage. If methods listed above cannot return the bow assemblies to a serviceable condition, replace the bow assemblies.

(2) Repaint bow assemblies by applying epoxy primer and air, drying for 18 hours or 30 minutes at 150° to 300°F. (66°C. to 149°C.). Apply two finish coats of paint conforming to Specification TT-E-527, color match per Standard 595, No. 34087, and air dry for 18 hours of 30 minutes at 150° to 300°F.

e. Assembly. Assemble bow assemblies as described below.

(1) Install rivet (3, fig. 9-1) and upset to secure bow support (7) to bow (8).

(2) Join bow (8) with bow support (5) and secure with retaining pin (1).

f. Installation. Install bow assemblies as described below.

(1) Position air-lock chamber (8, fig. 9-2) adjacent to doors in end panel of shelter. Engage zipper between air-lock adapter and air-lock chamber and close zipper.

(2) Pull chamber out to full length from shelter entrance. Straighten sod cloth around chamber.

(3) Drive bow spikes (7, fig. 9-2) at base of bows (8, fig. 9-1). Install bows over head of bow spikes.

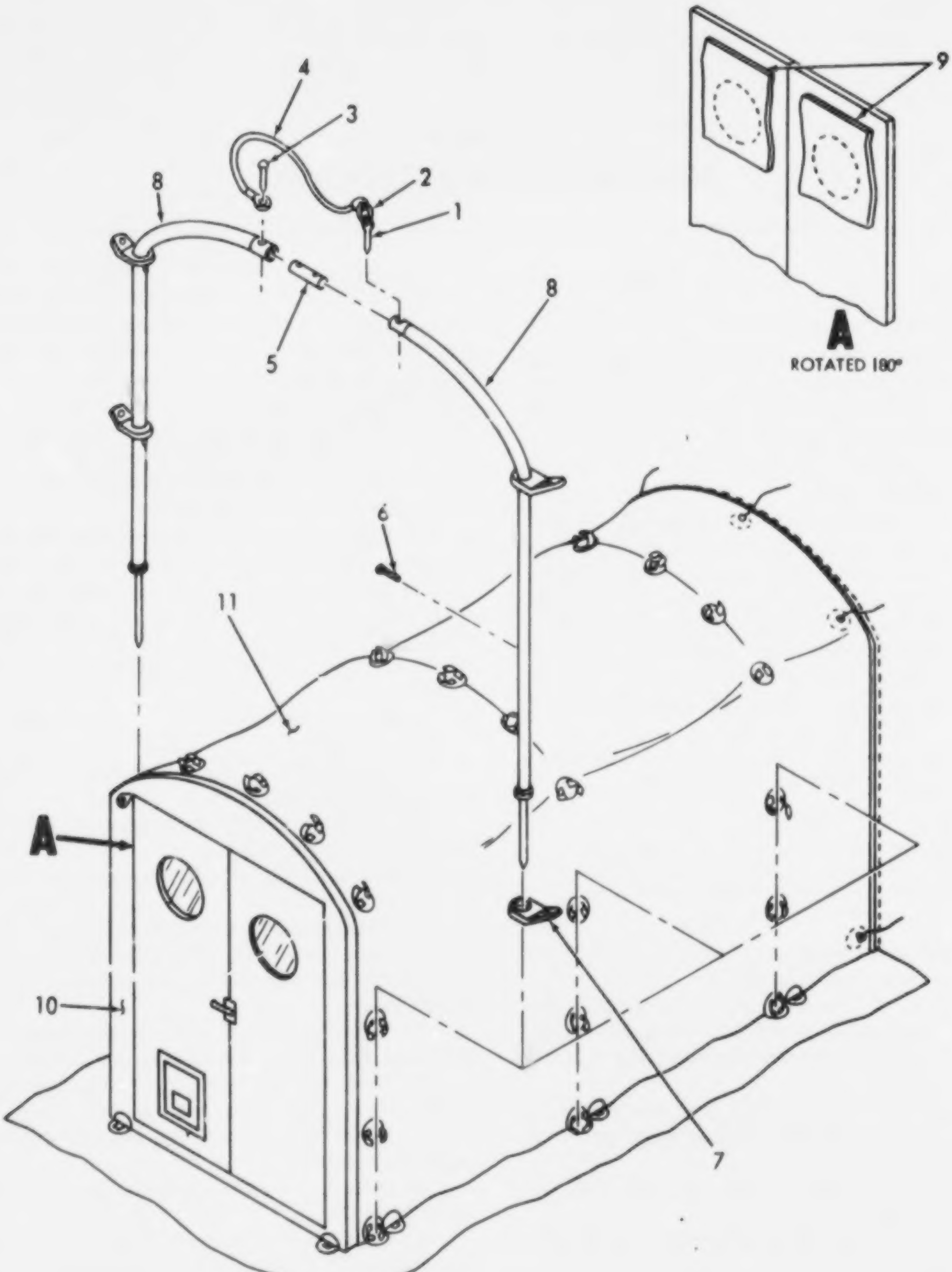
(4) Drive tent pins (6, fig. 9-2) to secure sod cloth of chambers.

(5) Install ground anchors (5) and cable assemblies (3).

(6) Connect air-lock chamber guy lines to cable assemblies (3). Tighten guy lines evenly.

NOTE

If bow is used for left hand side it has correct hole size for rivets (0.196) (0.4978 cm). If it is used for right hand side the hole must match the pin hole of the bow support (0.250) (0.635 cm). Ream hole if required.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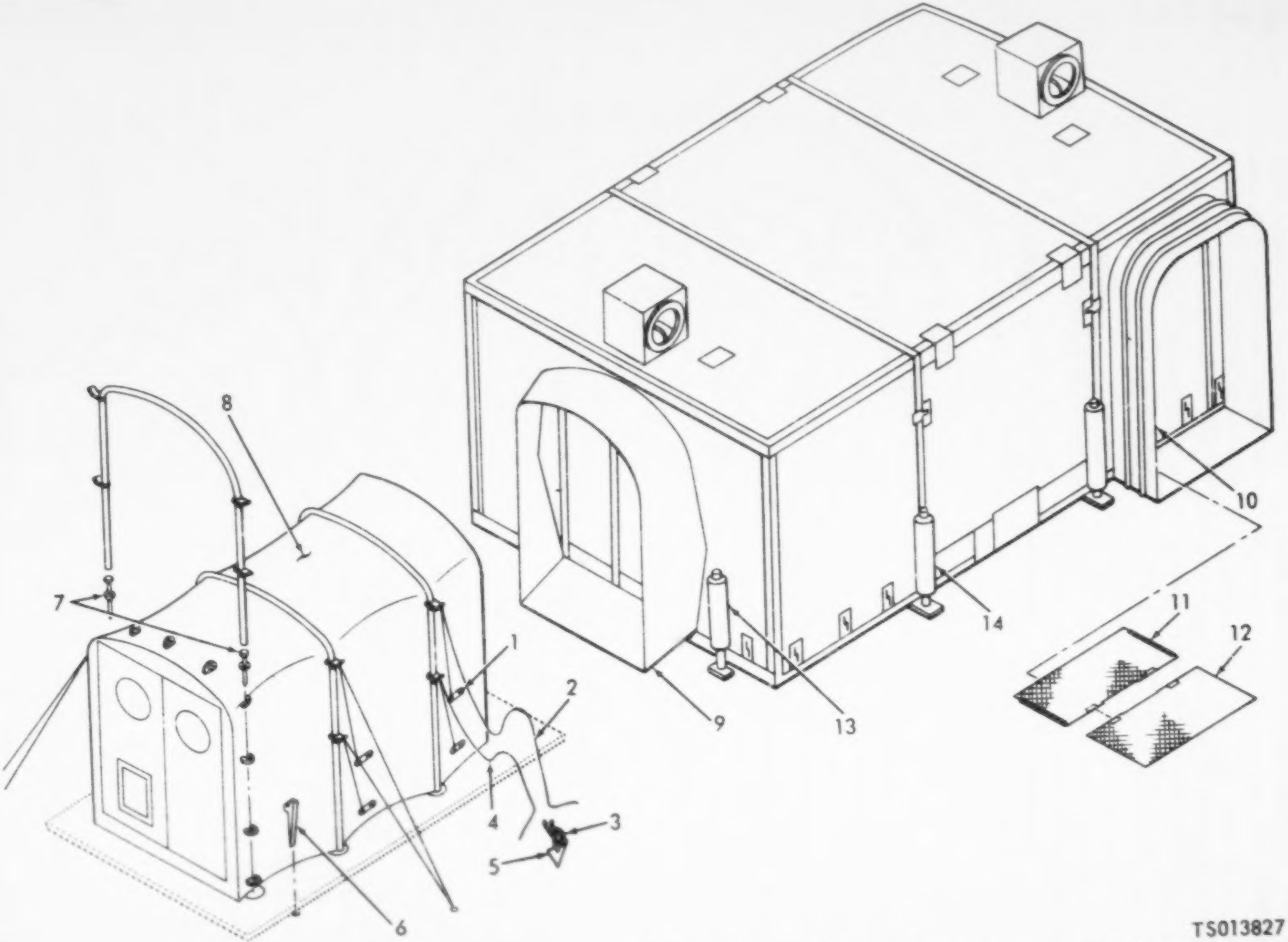
1. Retaining pin (3)
2. Retaining pin ring (3)
3. Rivet (3)
4. Retaining pin lanyard (3)
5. Bow support (3)
6. Screw (12)
7. Guy line bracket (12)
8. Bow (6)
9. Blackout curtain assembly (2)
10. End panel and door ay
11. Fabric body assembly

Figure 9-1. Air Lock Chamber, Disassembly (TS 013826)



1. Guy line slip (14)
2. Guy line rope (8)
3. Cable assembly (14)
4. Guy line rope (6)
5. Ground anchor (14)
6. Tent pin (6)
7. Bow spike (6)
8. Air-lock chamber
9. Air lock adapter
10. Bellows adapter
11. Tread plate, upper
12. Tread plate, lower
13. Jack assembly (4)
14. Jack assembly (4)

Figure 9-2. Shelter Accessories, Disassembly (TS 013827)

9-3. Air-Lock Chamber End Panel and Door Assembly

a. General. The end panel and door assembly encloses the end and provides entry into the air-lock chamber. The end panel and door assembly consists of an end panel assembly and an anti-back-draft valve, door assembly with two doors equipped with 12 inch (30.48 cm) diameter windows.

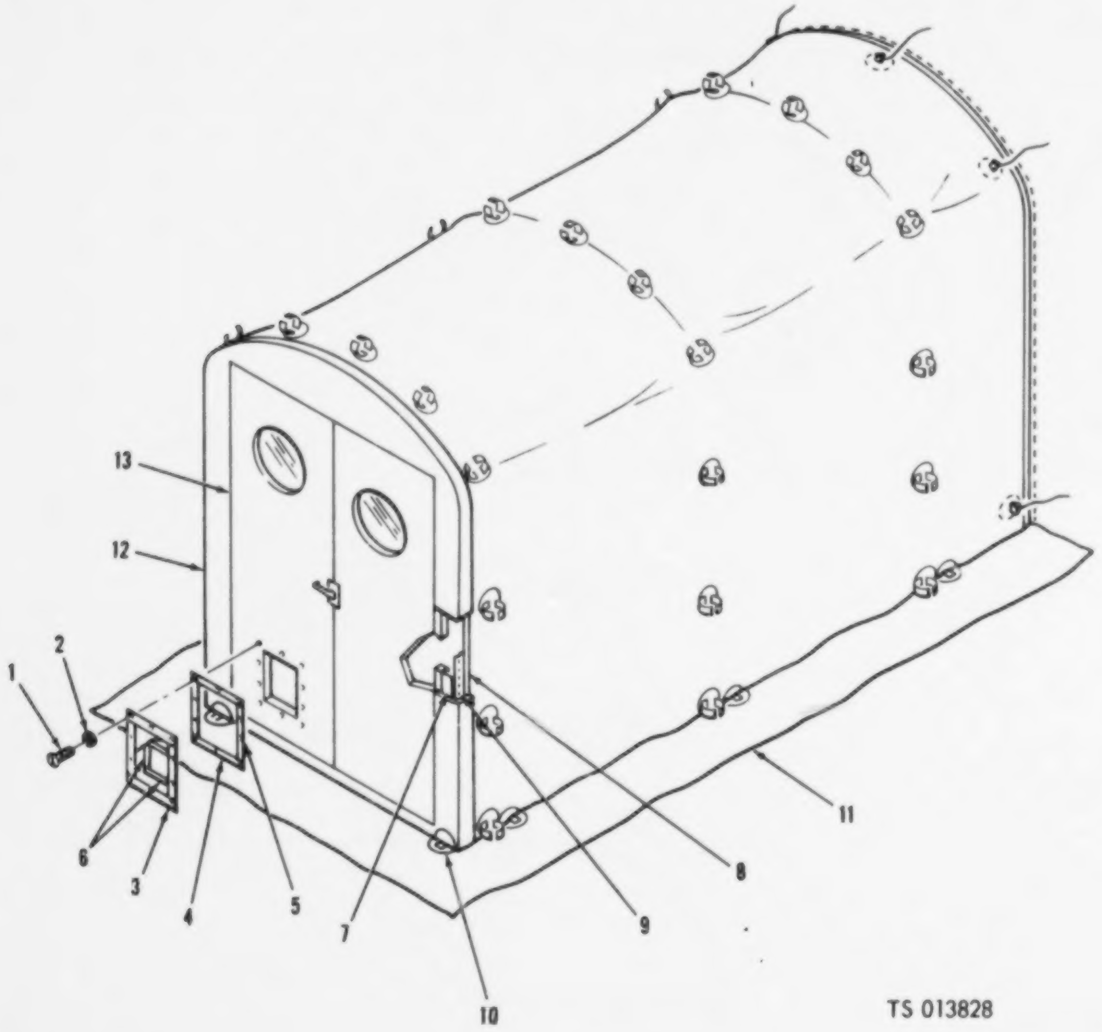
b. Removal. Remove end panel and door assembly as follows (fig. 9-1).

(1) Remove cemented blackout curtain assemblies (9, fig. 9-1).

(2) Open fabric fastener tape and zipper that attaches end panel and door assembly (10) to the fabric body assembly (11). Remove end panel and door assembly (10).

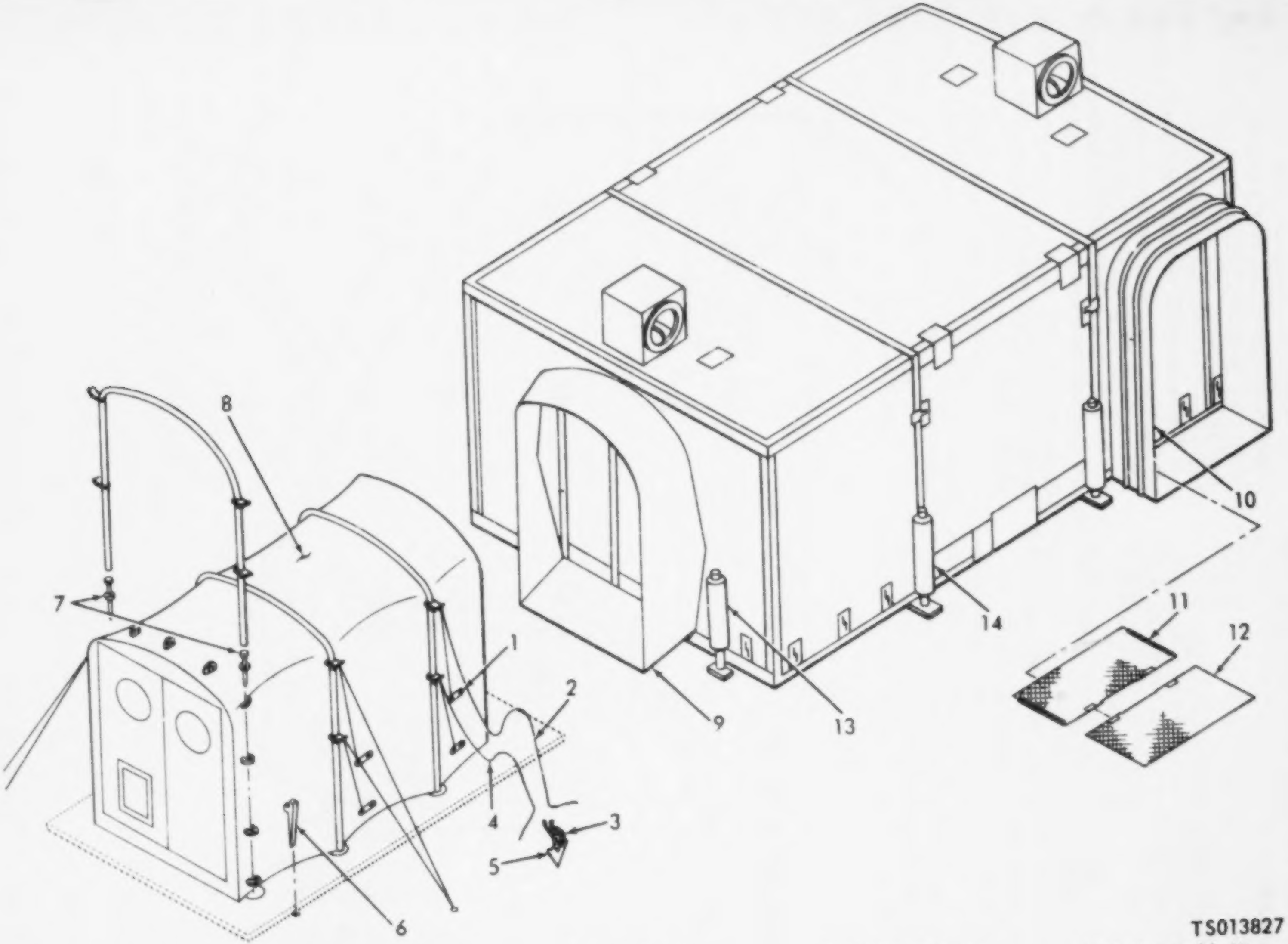
c. Disassembly. Disassemble end panel and door assembly as required to replace damaged parts as follows (fig. 9-3).

(1) Remove screws (1, fig. 9-3), lockwashers (2), and anti-backdraft valve (3). If required for replacement, peel gaskets (4, 5, 6) from anti-backdraft valve (3) and use cleaning solvent to remove adhesive from valve housing.



1. Screw (10)
2. Lockwasher (10)
3. Anti-backdraft valve
4. Gasket (2)
5. Gasket (2)
6. Gasket (2)
7. Reinforcing tape
8. Pile facric fastener tape
9. Separating pin half of zipper
10. Tent pin patch assembly (2)
11. Ground apron
12. End panel
13. Door assembly

Figure 9-3. Air Lock Chamber Door (TS 013828)



1. Guy line slip (14)
2. Guy line rope (8)
3. Cable assembly (14)
4. Guy line rope (6)
5. Ground anchor (14)
6. Tent pin (6)
7. Bow spike (6)
8. Air-lock chamber
9. Air lock adapter
10. Bellows adapter
11. Tread plate, upper
12. Tread plate, lower
13. Jack assembly (4)
14. Jack assembly (4)

Figure 9-2. Shelter Accessories, Disassembly (TS 013827)

9-3. Air-Lock Chamber End Panel and Door Assembly

a. General. The end panel and door assembly encloses the end and provides entry into the air-lock chamber. The end panel and door assembly consists of an end panel assembly and an anti-back-draft valve, door assembly with two doors equipped with 12 inch (30.48 cm) diameter windows.

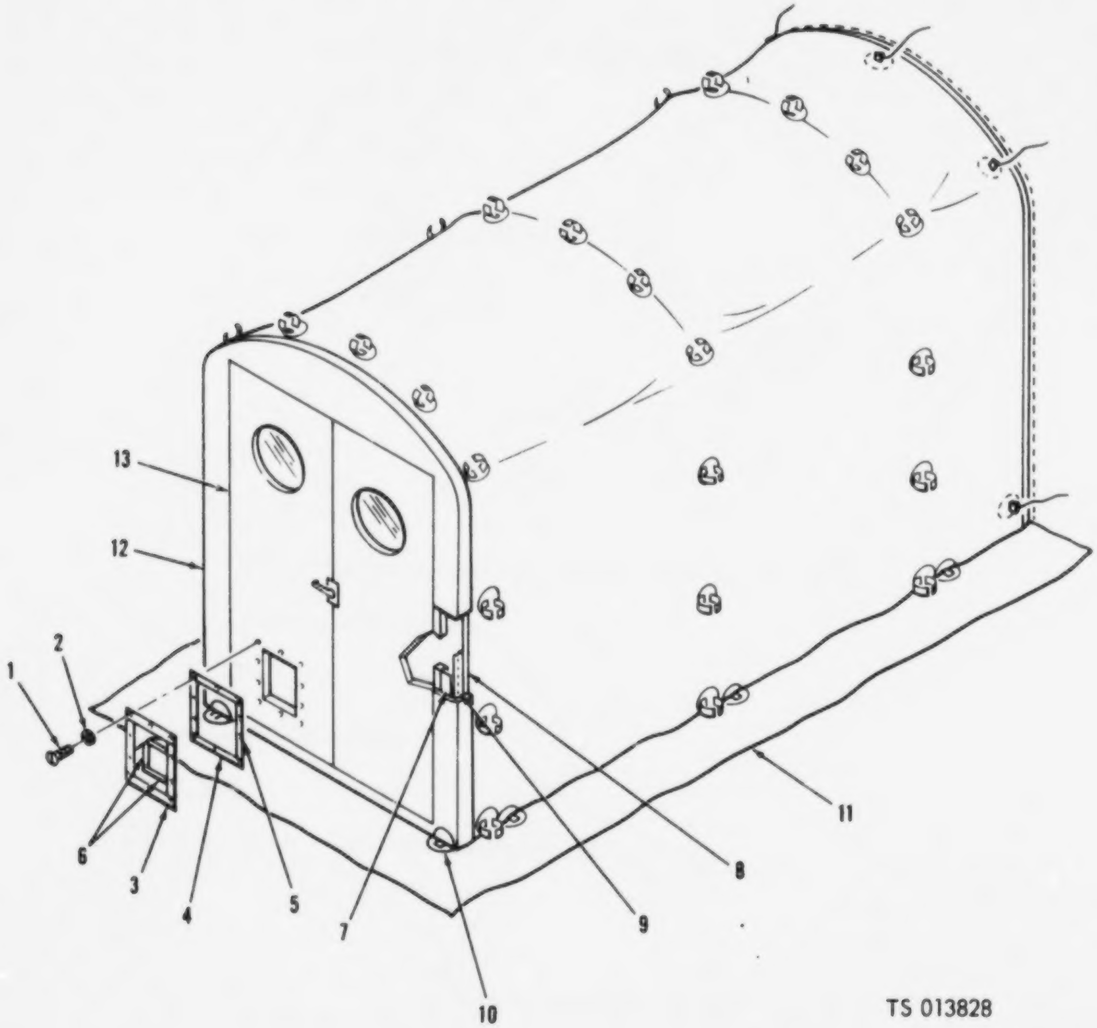
b. Removal. Remove end panel and door assembly as follows (fig. 9-1).

(1) Remove cemented blackout curtain assemblies (9, fig. 9-1).

(2) Open fabric fastener tape and zipper that attaches end panel and door assembly (10) to the fabric body assembly (11). Remove end panel and door assembly (10).

c. Disassembly. Disassemble end panel and door assembly as required to replace damaged parts as follows (fig. 9-3).

(1) Remove screws (1, fig. 9-3), lockwashers (2), and anti-backdraft valve (3). If required for replacement, peel gaskets (4, 5, 6) from anti-backdraft valve (3) and use cleaning solvent to remove adhesive from valve housing.



1. Screw (10)
2. Lockwasher (10)
3. Anti-backdraft valve
4. Gasket (2)
5. Gasket (2)
6. Gasket (2)
7. Reinforcing tape
8. Pile facric fastener tape
9. Separating pin half of zipper
10. Tent pin patch assembly (2)
11. Ground apron
12. End panel
13. Door assembly

Figure 9-3. Air Lock Chamber Door (TS 013828)

(2) Peel reinforcing tape (7) from door assembly (13) and end panel (12) as described below. Peel end panel (12) from door assembly.

(*a*) Carefully peel the cemented parts to separate, keeping the cloth soaked with solvent as the parts are peeled apart.

(*b*) Examine the separated parts for famage and repair damage by patching or replacement, before recementing parts.

(3) Cut stitches and remove pile fabric fastener tape (8), and separating pin half of zipper (9) as described below.

(*a*) Remove sewn fabric parts by carefully cutting stitches securing parts with a seam ripper or other sharpened tool. Remove cut stitches from fabric parts.

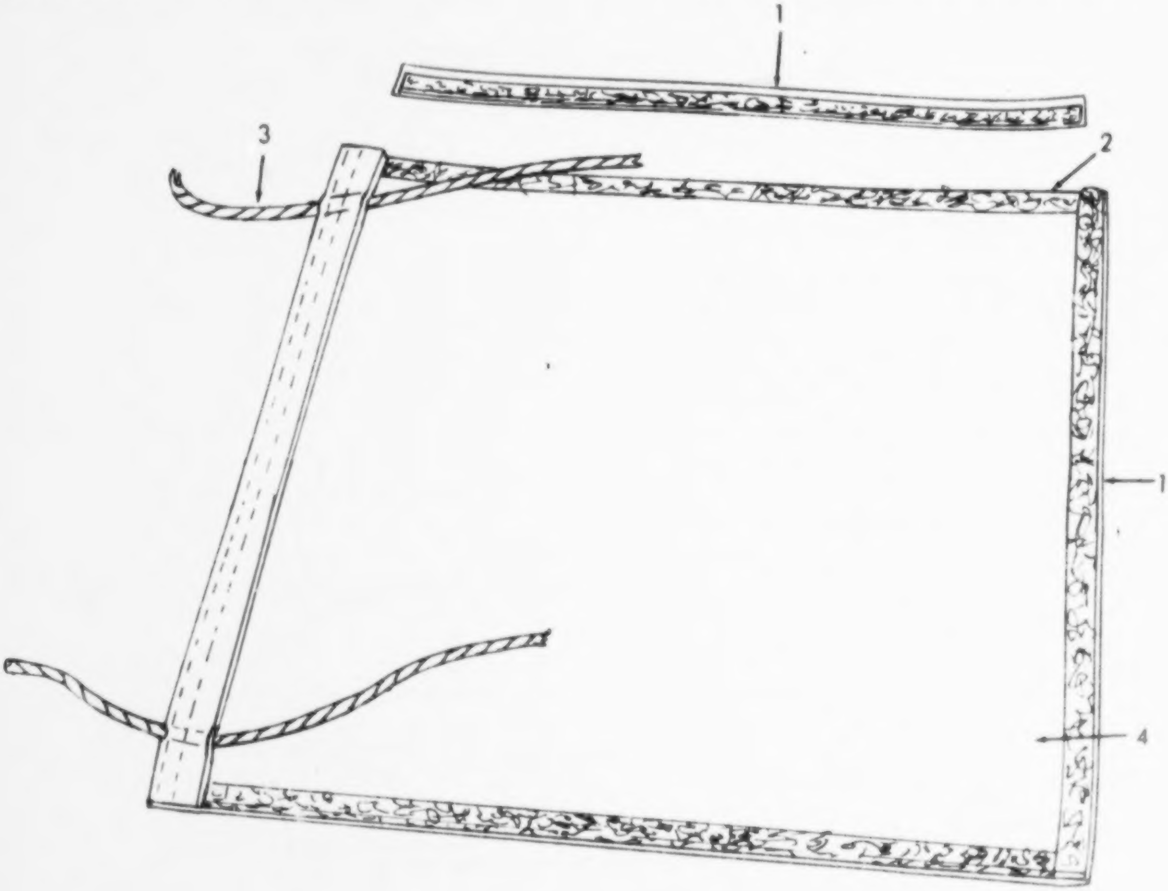
(*b*) Use extreme care in cutting stitches to prevent cutting or other damage to fabric. If fabric is cut or otherwise damaged, apply patch to damaged area.

(4) Disassemble window blackout curtains by cutting stitches as described in (3) (*a*) and (*b*), and separating parts as shown in figure 9-4.

d. Repair. Repair damage to air lock components as described in *c.* (3) (*a*) (*b*).

e. Assembly. Assemble end panel and door assembly using figure 9-3 as a guide and observing the following:

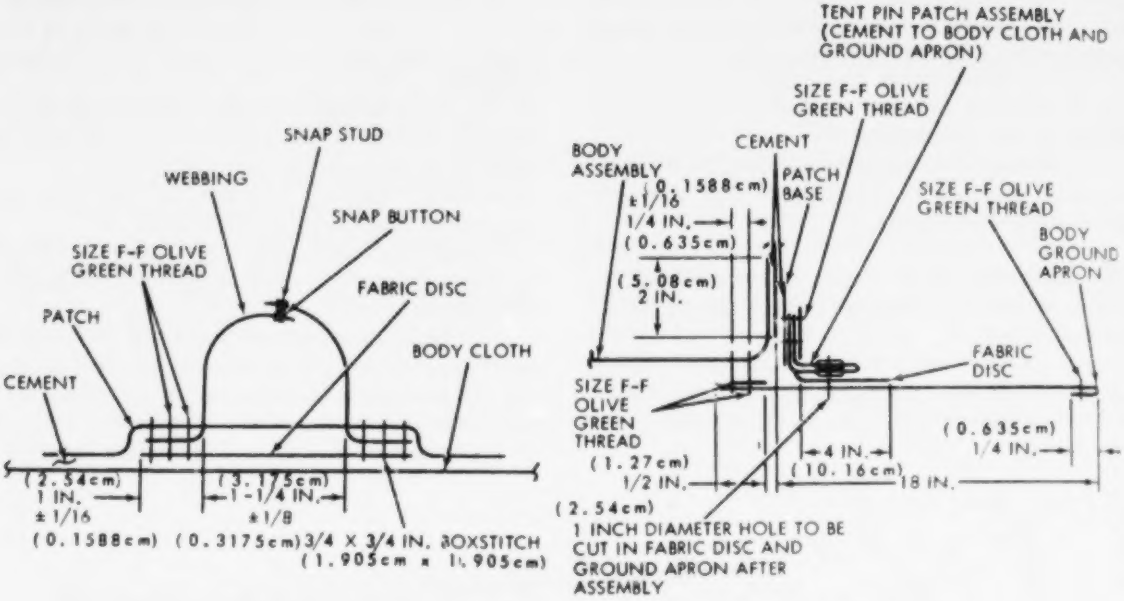
(1) Install ground apron (11, fig. 9-3), tent pin patch assemblies (10), separating pin half of zipper (9), and pile fabric fastener tape (8) on end panel (12) and secure by sewing as described below using size F-F olive green thread, and observing figure 9-5.



TS013829

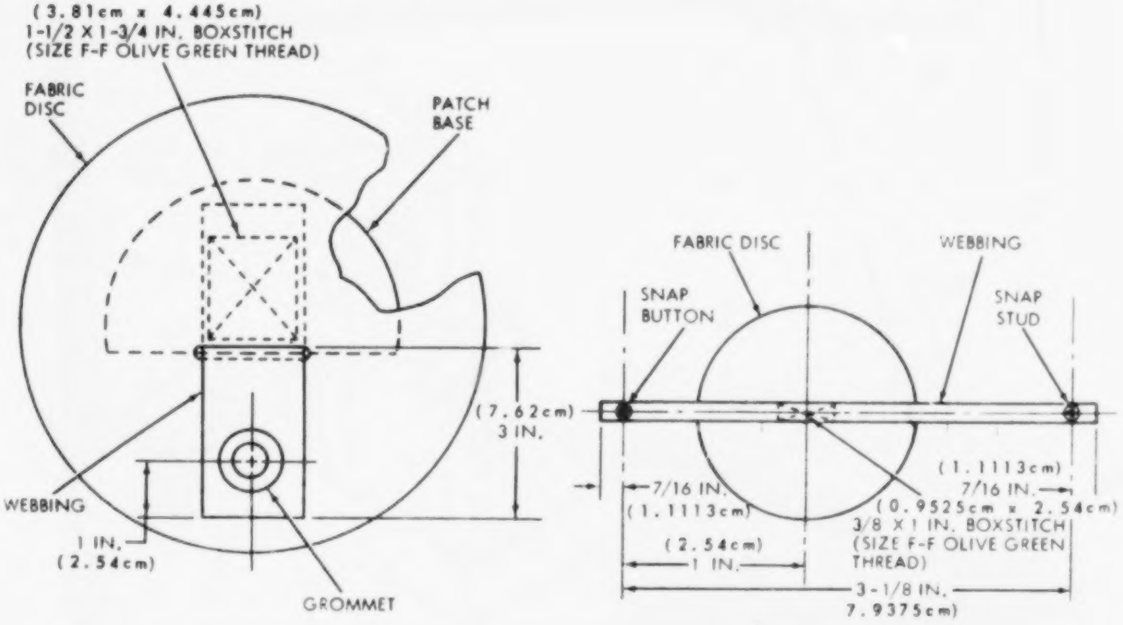
1. Fastener tape
2. Reinforcing strip
3. Cord (12 in. (30 cm) long, O.D. color) (2)
4. Curtain body

Figure 9-4. Blackout Curtain, Disassembly (TS 013829)


SNAP STUD
WEBBING
SNAP BUTTON
SIZE F-F OLIVE GREEN THREAD
FABRIC DISC
PATCH
BODY CLOTH
CEMENT
(2.54cm)
1 IN.
± 1/16
(0.1588cm)
(3.175cm)
1-1/4 IN.
±1/8
(0.3175cm)
3/4 X 3/4 IN. BOXSTITCH
(1.905cm x 1.905cm)
TENT PIN PATCH ASSEMBLY (CEMENT TO BODY CLOTH AND GROUND APRON)
SIZE F-F OLIVE GREEN THREAD
CEMENT
BODY ASSEMBLY
(0.1588cm)
±1/16
PATCH BASE
SIZE F-F OLIVE GREEN THREAD
1/4 IN.
(0.635cm)
BODY GROUND APRON
(5.08cm)
2 IN.
FABRIC DISC
SIZE F-F OLIVE GREEN THREAD
(0.635cm)
1/4 IN.
4 IN.
(10.16cm)
18 IN.
(1.27cm)
1/2 IN.
(2.54cm)
1 INCH DIAMETER HOLE TO BE CUT IN FABRIC DISC AND GROUND APRON AFTER ASSEMBLY

A. BOW HOLDING SNAP ASSEMBLY

B. TENT PIN PATCH ASSEMBLY

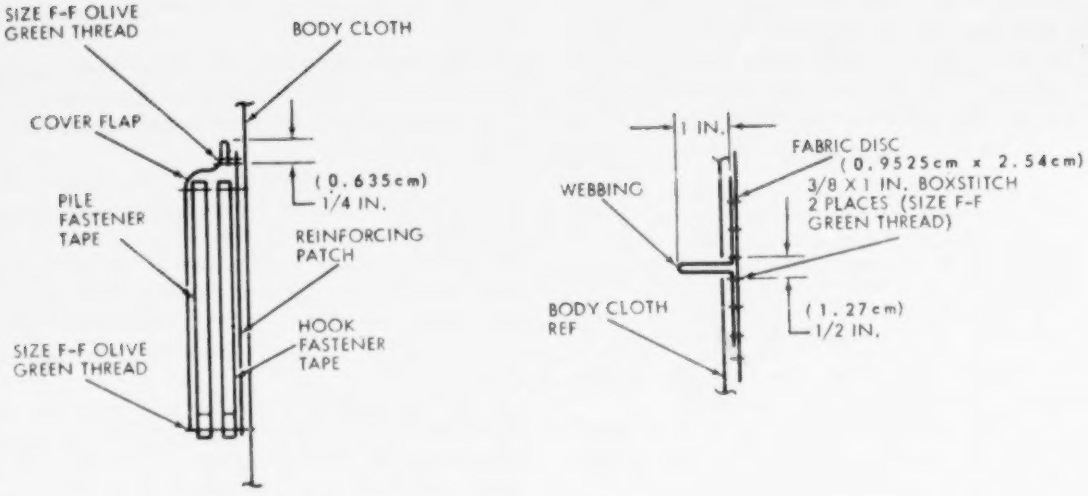

(3.81cm x 4.445cm)
1-1/2 X 1-3/4 IN. BOXSTITCH
(SIZE F-F OLIVE GREEN THREAD)
FABRIC DISC
PATCH BASE
(7.62cm)
3 IN.
WEBBING
1 IN.
(2.54cm)
GROMMET
FABRIC DISC
WEBBING
SNAP BUTTON
SNAP STUD
(1.1113cm)
7/16 IN.
7/16 IN.
(1.1113cm)
(0.9525cm x 2.54cm)
3/8 X 1 IN. BOXSTITCH
(SIZE F-F OLIVE GREEN THREAD)
(2.54cm)
1 IN.
3-1/8 IN.
7.9375cm)

C. TENT PIN PATCH ASSEMBLY INSTALLATION

D. LIGHT FIXTURE PATCH ASSEMBLY

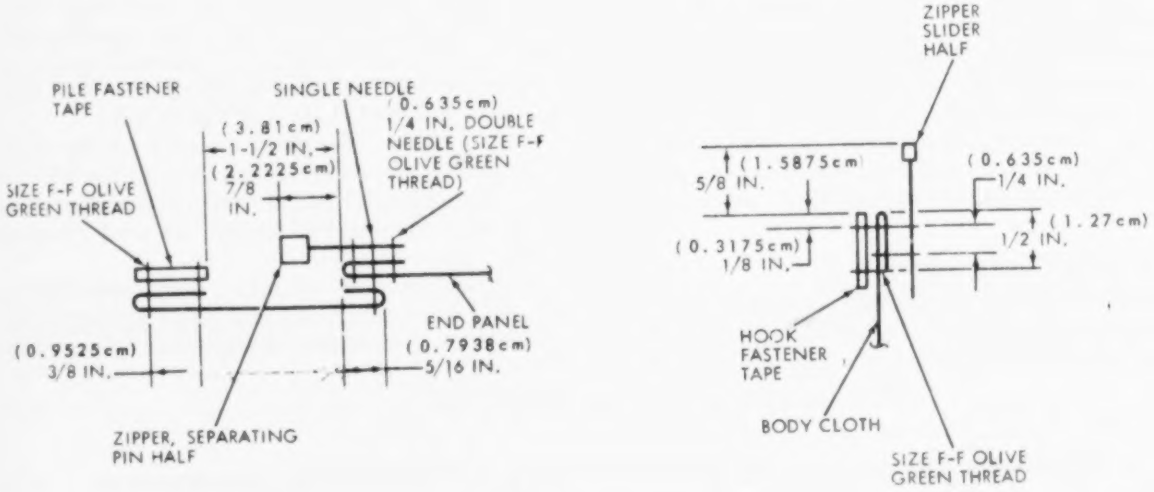
TS 013830

Figure 9-5. Air Lock Components Sewing (Sheet 1 of 2) (TS 013830)


SIZE F-F OLIVE GREEN THREAD
BODY CLOTH
COVER FLAP
(0.635cm)
1/4 IN.
PILE FASTENER TAPE
REINFORCING PATCH
HOOK FASTENER TAPE
SIZE F-F OLIVE GREEN THREAD
1 IN.
FABRIC DISC
(0.9525cm x 2.54cm)
3/8 X 1 IN. BOXSTITCH 2 PLACES (SIZE F-F GREEN THREAD)
WEBBING
BODY CLOTH REF
(1.27cm)
1/2 IN.

E. ELECTRICAL PATCH ASSEMBLY

F. TIE PATCH ASSEMBLY


PILE FASTENER TAPE
SINGLE NEEDLE
(0.635cm)
1/4 IN. DOUBLE NEEDLE (SIZE F-F OLIVE GREEN THREAD)
(3.81cm)
1-1/2 IN.
(2.2225cm)
7/8 IN.
SIZE F-F OLIVE GREEN THREAD
END PANEL
(0.7938cm)
5/16 IN.
(0.9525cm)
3/8 IN.
ZIPPER, SEPARATING PIN HALF
ZIPPER SLIDER HALF
(1.5875cm)
5/8 IN.
(0.635cm)
1/4 IN.
(1.27cm)
1/2 IN.
(0.3175cm)
1/8 IN.
HOOK FASTENER TAPE
BODY CLOTH
SIZE F-F OLIVE GREEN THREAD

G. ZIPPER ASSEMBLY

TS 013831

Figure 9-5. Air Lock Components Sewing (Sheet 2 of 2) (TS 013831)

(*a*) Position parts to be sewn together and temporarily secure the position of the parts. Sew parts together (fig. 9-6) with five to nine stitches per inch (2.54 cm). Use single needle or double needle stitching as noted on removed parts.

NOTE

This type of stitch 301 (fig. 9-6) shall be formed with two threads: one needle thread, A, and one bobbin thread, B. A loop of thread A shall be passed through the material and interlaced with thread B. Thread A shall be pulled back so that the interlacing shall be midway between surfaces of the material or materials being sewn.

(*b*) Figure 9-5 illustrates sewing repair procedures on air-lock chamber components.

(2) Cement end panel (12, fig. 9-3) to door assembly (13) and cement reinforcing tape (7) to end panel (12) and door assembly (13).

(3) Install gaskets (4, 5, 6, fig. 9-3) on valve (3) using adhesive (140, Dow Corning Corp., Midland, Michigan). Install anti-backdraft valve (3) on door assembly (13) (with valve counter-weight up) and secure with lockwashers (2) and screws (1).

(4) Position blackout curtain components together and secure by sewing as described above.

f. Installation. Install end panel and door assembly (10, fig. 9-1) using figure 9-1 as a guide and observing the following.

(1) Install blackout curtain assemblies over door assembly windows as described above.

(2) Engage and close zipper between end panel and door assembly (10) and fabric body assembly (10) and fabric body assembly (11).

9-4. Fabric Body Assembly

a. General. The fabric body assembly provides top, sides, and bottom of the air-lock chamber. The body assembly consists of a fabric body with various fabric attachment and reinforcing components installed.

b. Removal. Removal of fabric body assembly consists of removing the other components of the air-lock chamber as described in paragraphs 9-2 and 9-3.

c. Disassembly. Disassemble fabric body assembly as required for replacement of damaged components as follows (fig. 9-7).

(1) Untie and remove cord (1, fig. 9-7). Peel tie patch assemblies (2), bow holding snap assemblies (3), light and fixture patch assemblies (4), and reinforcing patches (5) from body cloth (11) as described above.

(2) Cut stitches and remove tent pin patch assemblies (6), ground aprons (7), electrical patch assemblies (8), slider half of zippers (9), and hook fabric fastener tape (10) from body cloth (11) as described above.

d. Repair. Repair damage to fabric body assembly as described in paragraph 5-7.

e. Assembly. Assemble fabric body assembly using figure 9-7 as a guide and observing the following.

(1) Install hook fabric fastener tapes (10, fig. 9-7), slider half of zippers (9), electrical patch assemblies (8), ground aprons (7), and tent pin patch assemblies (6) on body cloth (11) and secure by sewing as described above, using size F-F olive green thread, and observing figure 9-5.

(2) Cement reinforcing patches (5, fig. 9-7), light and fixture patch assemblies (4), bow holding snap assemblies (3), and tie patch assemblies (2) on body cloth as described above. Tie cord (1) in tie patch assemblies (2).

f. Installation. Install fabric body assembly (11, fig. 9-1) using figure 9-1 as a guide and observing installation procedures described in paragraphs 9-2 and 9-3.

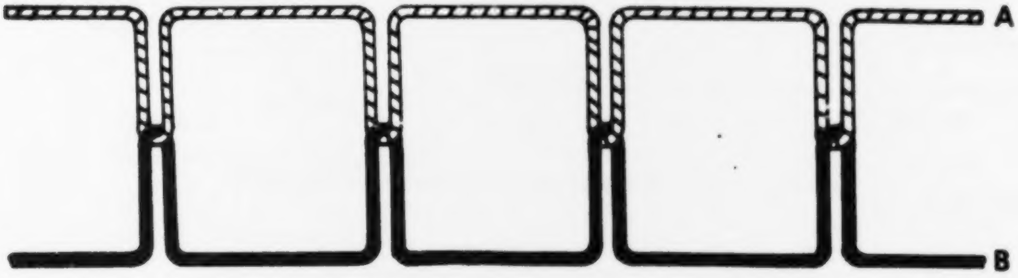
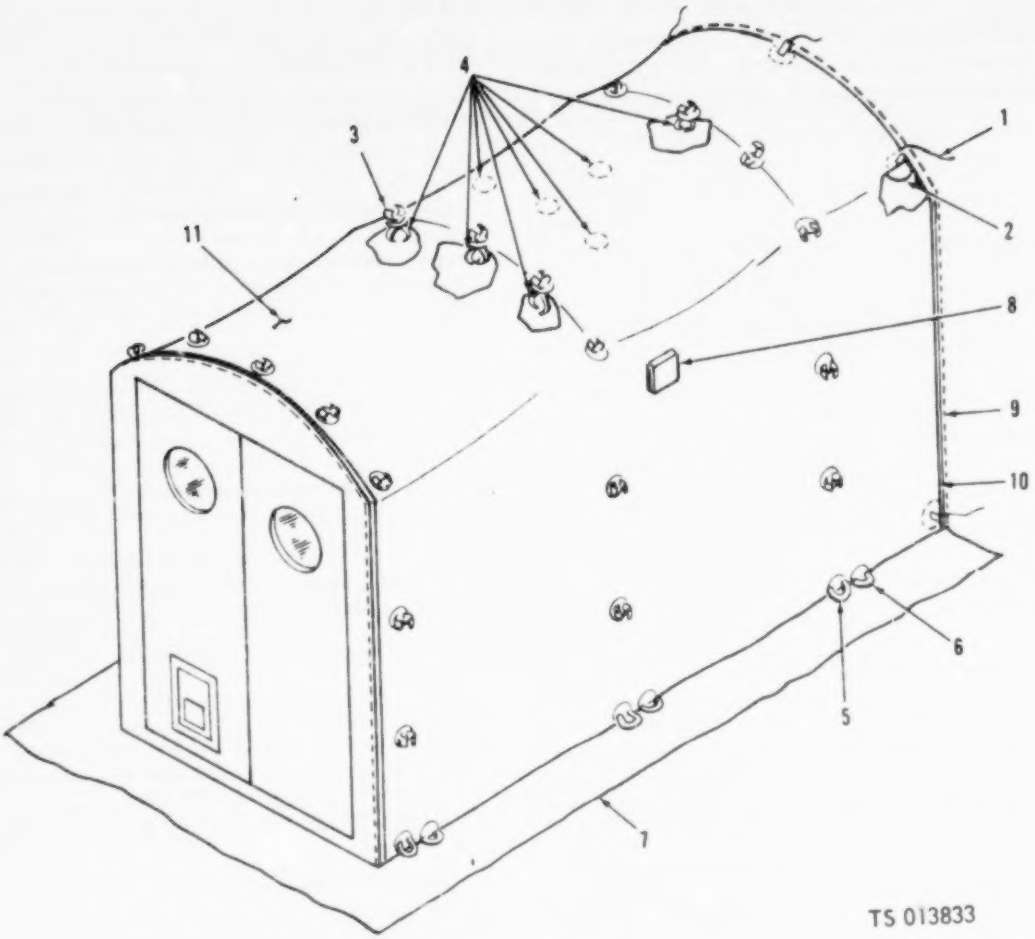


Figure 9-6. Stitch Type 301 (TS 013832)



1. Cord (5)
2. Tie patch assembly (5)
3. Bow holding snap assembly (8)
4. Light and fixture patch assembly (8)
5. Reinforcing patch (6)
6. Tent pin patch assembly (6)
7. Ground apron (2)
8. Electrical patch assembly (2)
9. Slider half of zipper (2)
10. Hook fabric fastener tape (2)
11. Body cloth

Figure 9-7. Air Lock Chamber Fabric Body Disassembly (TS 013833)

CHAPTER 10

REPAIR OF WATER SYSTEM

Section I. PLUMBING COMPONENTS REPAIR INSTRUCTIONS

10-1. General

This section contains the water system plumbing components used to supply the shelter with hot and cold water and drainage provisions. The water plumbing system consists of a centrifugal sump pump, sump assembly, check valve, water and drain tube assemblies, manifold assemblies, and external supply and drain hoses.

10-2. Centrifugal Sump Pump

a. General. The sump pump is used to pump water from the stainless steel sump, located inside the shelter, to an external drainline.

b. Remove damaged or defective pump assembly as follows:

(1) Remove the water service box cover.

(2) Disconnect the inlet and outlet lines from pump (4, fig. 4-23) located inside service inlet box.

(3) Disconnect electrical connector from end of pump (4).

(4) Remove nuts (2) and washers (3) securing the pump to the pump mounting bracket.

(5) Loosen and slide off clamp (1) securing pump (4) to pump mounting bracket.

(6) Remove pump (4) from water service inlet box.

c. Test. Test water pump using a multimeter, (para 11-2) continuity light or other suitable continuity checking device.

d. Installation. Install the sump pump assembly as follows:

CAUTION

Be sure electrical source is off before connecting electrical leads.

(1) Position pump (4, fig. 4-23) in proper position and secure with nuts (2) and washers (3).

(2) Slide clamp (1) over pump (4) and pump mounting bracket and tighten securely.

(3) Connect electrical connector to end of pump (4).

(4) Connect inlet and outlet lines to pump (4).

e. Repair and Overhaul. The sump pump is not provisioned for breakdown or replacement of parts. Remove and replace defective pump assembly only.

10-3. Drain Sump Assembly

a. General. The drain sump assembly is used to collect waste water from shelter and discharge it to the sump pump through means of a float switch inside the sump.

NOTE

There are two configureations of drain sumps available. Reparable drain sump should be installed in place of nonreparable whenever it becomes unserviceable. Refer to figure 10-3 to determine the type of sump installed in the shelter.

b. Removal. Refer to paragraph 4-40*a* and remove the sump assembly.

c. Disassembly. This procedure applies to reparable drain sump only. Disassemble the drain sump assembly as required to replace damaged components according to sequence of index numbers assigend to figure 10-4 and observing the following:

(1) Remove clamp ring by loosening knurled nut (1, fig. 10-4).

(2) Remove cover assembly (2) from drain sump.

(3) Remove rubber seal (3) from cover assembly by peeling from cemented area.

(4) Remove strainer assembly (4) from drain sump.

(5) Remove screw (5), lockwasher (6), pull (7), and strainer (8) from strainer assembly.

(6) Remove terminals (9) from electrical lead (11).

(7) Remove screws (10), pull out electrical wires, and disconnect electrical lead (11).

(8) Remove grommet (12) from float valve cover (13) and remove gasket (14) by peeling from cemented area.

(9) Unsolder all electrical leads and remove diode bridge (15) and relay (16) from valve body.

(10) Cut and remove lock wire (17) and unscrew level switches (18) from valve body.

(11) Remove screws (19) and slide out float valve body (20). Remove O-ring (21).

(12) Remove decal (22) from sump weldment (23).

d. Repair. Repair the shelter sump assembly as required to return it to a serviceable condition as follows:

(1) Inspect drain sump assembly for damaged threads, nicks, dents, or burrs. If possible, dress all nicks and burrs with emery cloth assuring that enough wall thickness of sump remains to assure sufficient strength. Minor dents in the sump assembly are acceptable so long as the function or fit is not affected. Dress minor damage to threads with emery cloth and assure that there are no leaks present. If methods listed above cannot return the sump assembly to serviceable condition, replace the sump assembly.

(2) Remove clamp which secures cover assembly to sump and inspect filter screen for damage or dirt, replace damaged screen. Clean screen assembly by washing with clean water under slight pressure and hitting against a solid surface using care not to damage screen assembly.

e. Assembly. Assemble the drain sump assembly using figure 10-4 as a guide and observing the following:

(1) Cement gasket (14) to valve cover (13).

(2) Cement rubber seal (3) to cover assembly (2) using rubber cement.

(3) Using schematic diagram for the reparable drain sump (FO-5) (located in back of manual) as a guide, solder all electrical leads according to MIL-S-6872 using Sn60 solder that conforms to specification QQ-S-[illegible]. Apply electrical varnish MIL-V-173 to all exposed electrical connections after soldering.

f. Test. Test drain sump assembly as described in paragraph 4-40c.

g. Installation. Install drain sump assembly as described in paragraph 4-40*d*.

10-4. Check Valve

a. General. The check valve is used to restrict flow of drain water in one direction only to prevent waste water from backing up into shelter.

b. Removal. Remove the check valve as described in paragraph 4-42.

c. Repair. Check valve is not reparable. Remove and replace defective valve only.

d. Installation. Install check valve in reverse order of removal (para 4-42).

10-5. Water Supply and Drain Tube Assemblies (Water Tunnel)

a. General. The water and drain tube assemblies are used to supply hot and cold water to the shelter and drain waste water from the shelter. They consist of stainless steel tubes with flared ends and equipped with nuts and sleeves.

b. Removal. Remove the supply and drain tube assemblies according to figures 10-1 and 10-2.

c. Repair and Overhaul. Repair or overhaul the shelter supply and tube assemblies as required to return to a serviceable condition as follows:

(1) Inspect all tube assemblies for damaged threads, nicks, dents, bent tubes or burrs. If possible, dress all nicks and burrs with emery cloth assuring that enough wall thickness of tube remains to assure sufficient strength. Minor dents in the tube assembly are acceptable so long as the function or fit of tubes is not affected. Dress minor damage to threads with emery cloth and then pressure check to assure that there are no leaks present. Minor bent tubes are acceptable as long as function or fit is not affected. If possible straighten tubes using a tube bending tool or clamping in a padded vise, or by hand. If methods listed above cannot return the tube assemblies to serviceable condition, replace the tube assembly.

(2) Inspect mounting brackets for damage and misalignment. If possible straighten any bent or misaligned brackets by means of a padded vise, pliers, or hammer. Repaint bracket assemblies by applying primer and allowing to dry and painting with paint conforming to Federal Standard 595, Color Chip 34087.

d. Installation. Install the water supply and drain tube assemblies in reverse order of removal, and observe the following:

(1) Use new packings at required fittings.

(2) Pot all tube assemblies which enter the shelter using RTV-731, Dow Corning Corp., Midland, Michigan, or equivalent.

(3) Torque all fittings using good shop practice.

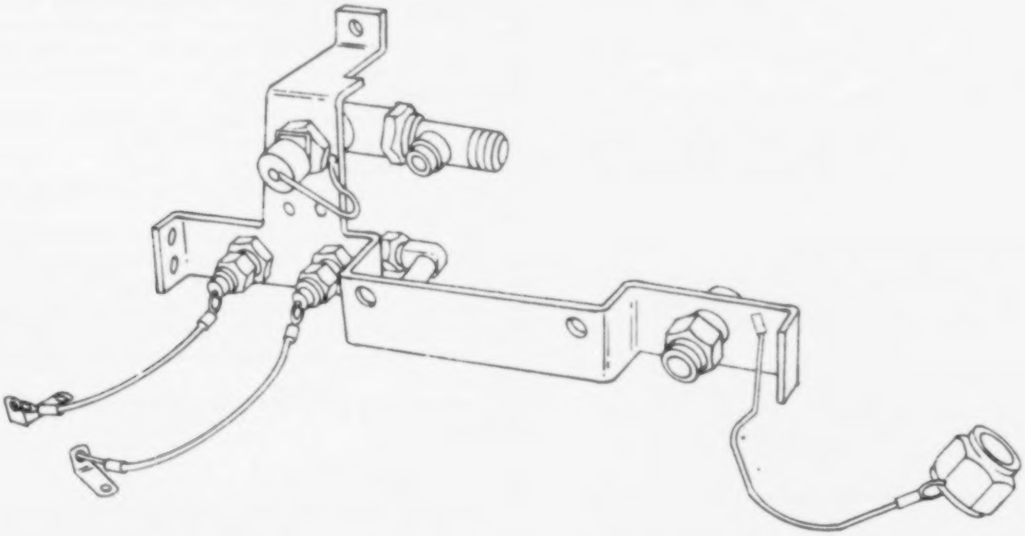
e. Test. Test the water system and vacuum plumbing for leaks as follows:

(1) Install and tighten all nuts, caps, and plugs on water line and vacuum stubs extending from water box into shelter.

(2) Install and tighten all nuts, caps, and plugs in plumbing outlet box of shelter.

(3) Connect air supply (60 PSIG)(4.218 kg per sq cm) to "cold water in" and check connections for leaks.

(4) Connect air supply (60 PSIG)(4.218 kg per sq cm) to "hot water in" and check connections for leaks.

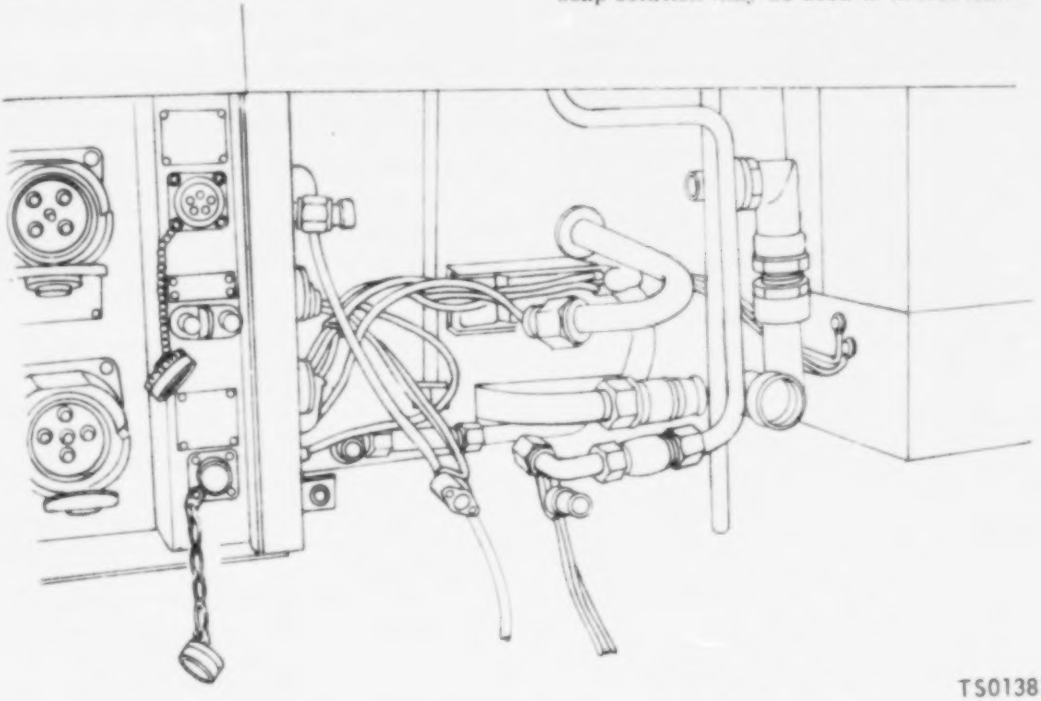


TS013834

Figure 10-1. Plumbing System. Installation and Disassembly (Sheet 1 of 2) (TS 013834)

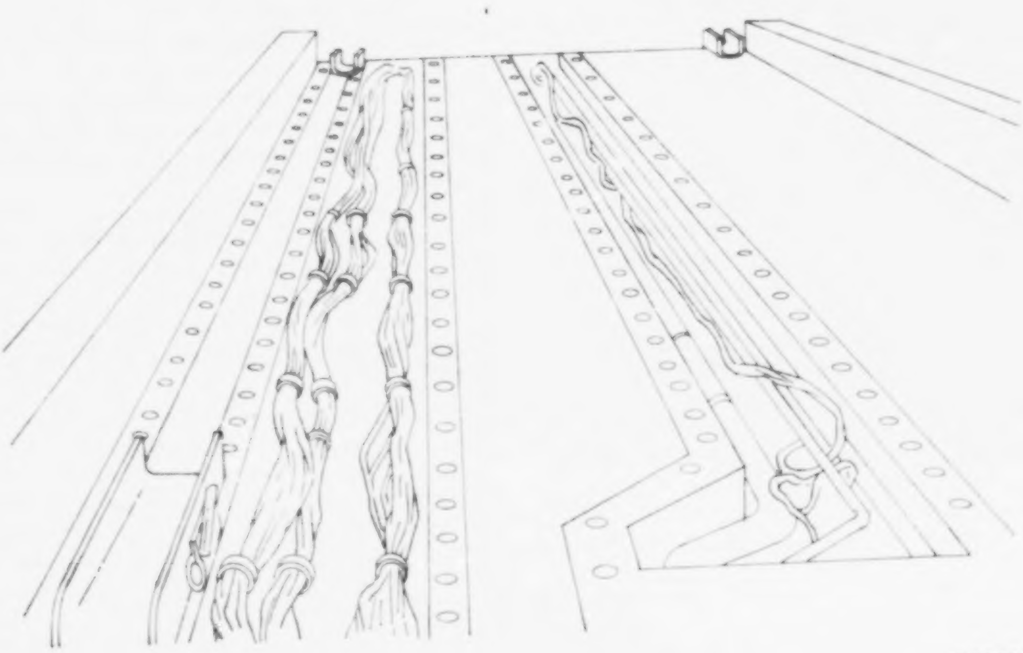
(5) Install plug in sump drain line. Apply air and check drain lines for leaks.

(6) Connect air supply (60 PSIG) (4.218 kg per sq cm) to vacuum system and check for leaks. Liquid soap solution may be used to detect leaks.



TS013835

Figure 10-1. Plumbing System, Installation and Disassembly (Sheet 2 of 2) (TS 013835)



TS013836

Figure 10-2. Water Tunnel (TS 013836)

Section II. EXTERNAL WATER AND DRAIN HOSE ASSEMBLIES

10-6. General

This section contains the water system external water and drain hose assemblies used to connect an external supply of hot and cold water to the shelter water service inlet box, or outlet box if an adjacent shelter is used. The drain hose assembly provides a means of draining waste water to an area away from shelter.

10-7. Hot and Cold Water Hose

a. General. The hot and cold water hose assembly is a dual heavy duty neoprene hose used to supply the shelter with hot and cold water.

NOTE

Shelters used in areas with ambient temperatures below 38°F (3°C) must be equipped with an electrically heated hose assembly.

b. Removal.

(1) Detach the dual hot and cold water hose from hot and cold water union at the water service inlet or outlet boxes.

(2) Detach the water hose heater receptacle if used, from the receptacle at the water service inlet or outlet boxes.

c. Repair and Overhaul. Repair or overhaul the dual hot and cold water hose assemblies as required to return to a serviceable condition as follows:

(1) Dress any nicks, scratches, or burrs on fittings with emery cloth, and pressure test for leaks.

(2) Minor cuts or abrasions on the rubber portion of the hose are acceptable if normal function of the hose is not impaired. Cover abrasions and minor cuts with vinyl or mylar tape. Minor cuts or holes which extend to the interior of the hose shall be repaired by vulcanizing a rubber patch over the hole or cut in accordance with manufacturer's instructions.

(3) Clean the hose assembly by blowing out with compressed air. Large obstructions in the hose shall be removed using a plumber's snake or other suitable cleaning tool.

d. Installation. Install the dual hot and cold water hose assembly by inserting the hose assembly fittings over the hot and cold water unions.

10-8. Water Drain Hose

a. General. The drain hose assembly is a heavy duty neoprene hose used to provide waste water drainage away from the expandable shelter.

NOTE

Shelters used in areas with ambient temperatures below 38°F 3°C) must be equipped with an electrically heated hose assembly.

b. Removal.

(1) Detach from the drain union at the water service inlet or outlet boxes.

(2) Detach the drain hose heater receptacle, if used, from the receptacle at the water service inlet or outlet water boxes.

c. Overhaul. Overhaul the drain hose assembly using procedures required to return to a serviceable condition as follows:

(1) Dress any nicks, scratches, or burrs on fittings with emery cloth, and pressure test for leaks.

(2) Minor cuts or abrasions on the rubber portion of the hose are acceptable if normal function of the hose is not impaired. Cover abrasions and minor cuts with vinyl or mylar tape. Minor cuts or holes which extend to the interior of the hose shall be repaired by vulcanizing a rubber patch over the hole or cut in accordance with manufacturer's instructions.

(3) Clean the hose assembly by blowing out with compressed air. Large obstructions in the hose shall be removed using a plumber's snake or other suitable cleaning tool.

d. Installation. Install the drain hose assembly by inserting the hose assembly fitting over the drain union.

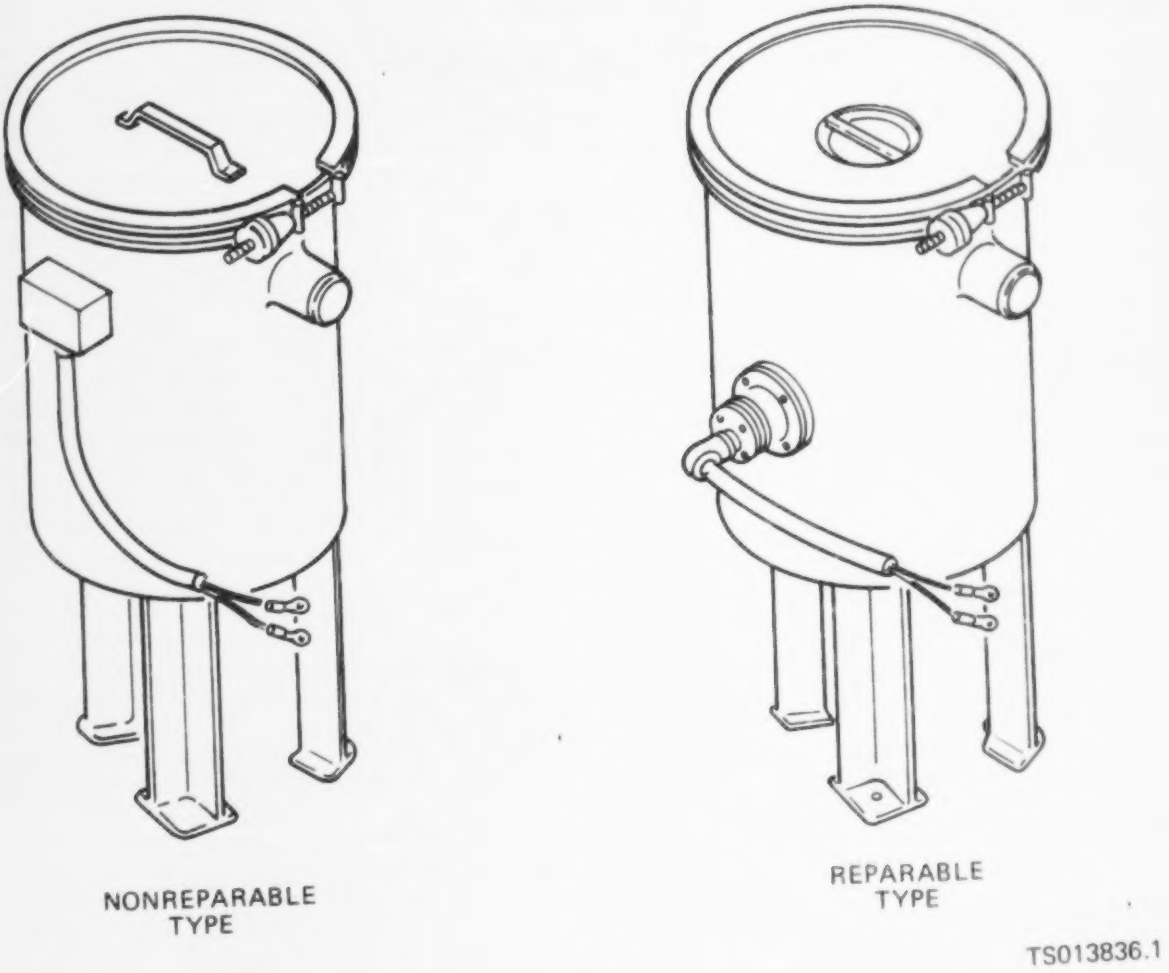
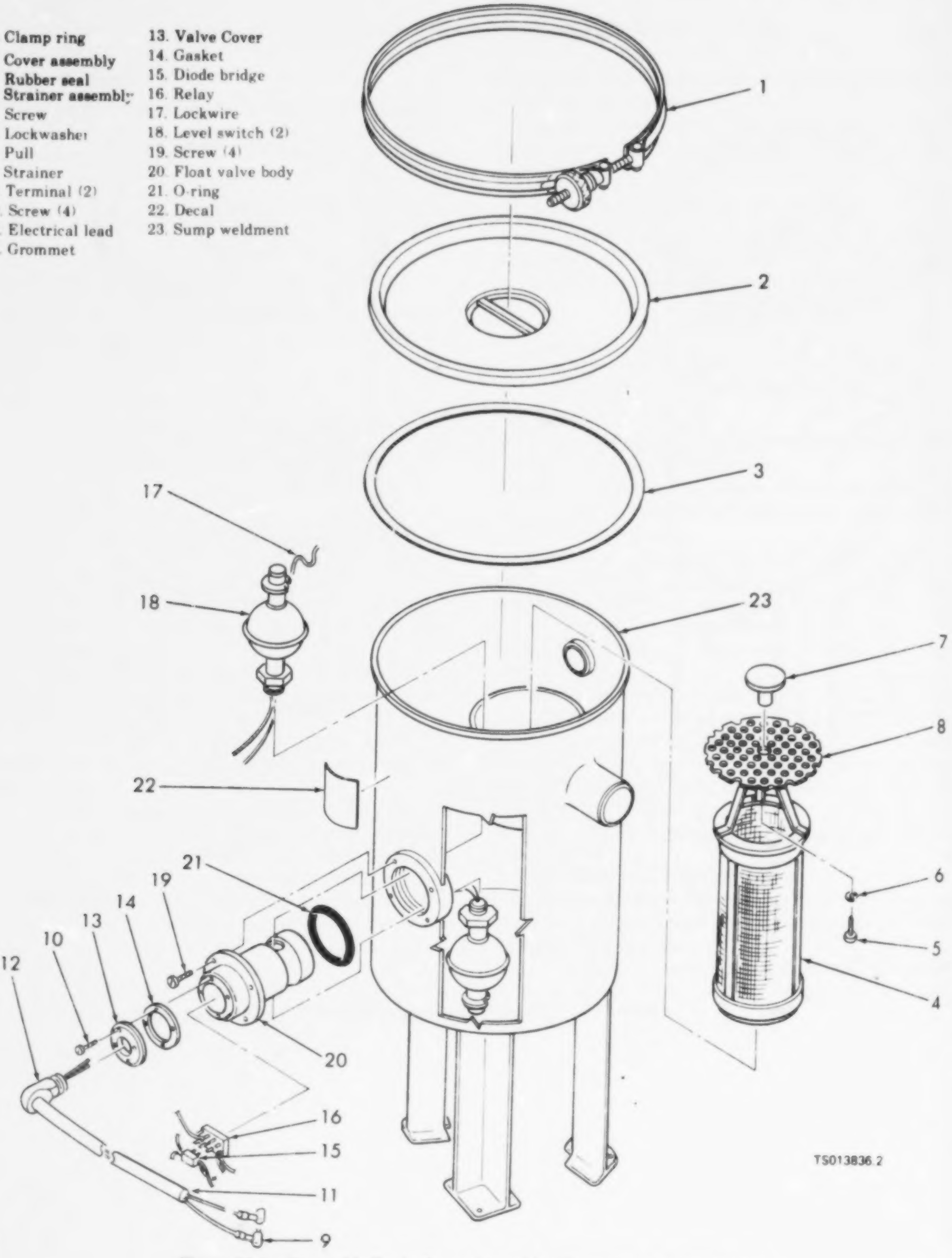

NONREPARABLE
TYPE
REPARABLE
TYPE
TS013836.1

Figure 10-3. Types of Drain Sumps (TS 013836.1)

1. **Clamp ring**
2. **Cover assembly**
3. **Rubber seal**
4. **Strainer assembly**
5. Screw
6. Lockwasher
7. Pull
8. Strainer
9. Terminal (2)
10. Screw (4)
11. Electrical lead
12. Grommet
13. **Valve Cover**
14. Gasket
15. Diode bridge
16. Relay
17. Lockwire
18. Level switch (2)
19. Screw (4)
20. Float valve body
21. O-ring
22. Decal
23. Sump weldment


1
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15
11
9
TS013836.2

Figure 10-4. Reparable Drain Sump Assembly - Disassembly (TS013836.2)

CHAPTER 11

MATERIAL USED IN CONJUNCTION WITH MAJOR ITEM

11-1. General

This chapter contains information on the use of multimeters.

11-2. General Instructions for Use of Multimeters

a. Introduction. In electrical troubleshooting, the Simpson 160, the TS-352B/U, and the AN/URM-105 will do the same job. Therefore, your shop sets may contain any one of these multimeters (fig. 11-1). Any of these three multimeters can be used to troubleshoot your equipment's electrical system. This section shows how.

NOTE

The Simpson 160 is only available in new shop sets as a substitute for the TS-325B/U or AN/URM-105.1180

b. Using the Ohms Scale. The ohms scale is used to make tests for continuity, shorts and resistaance.

(1) *"Zeroing" the meter (fig.11-2).* The multimeter must be set up and "zeroed" before making these tests. Do the following steps that match the multimeter you have:

(2) *Continuity tests.* Continuity tests are made to check for breaks in a circuit (such as the switch, light bulb, or electrical cable) (fig. 11-3). To make a continuity check, do the following steps:

(*a*) Set up and "zero" the multimeter (fig. 11-2).

CAUTION

Failure to do the following step can damage the multimeter.

(*b*) Disconnect the circuit being tested. To be safe, disconnect the battery ground strap.

(*c*) Connect the meter probes to both terminals of the circuit being tested. (The TS-352B/U is illustrated (fig. 11-3), but the probes are connected to the circuit the same way with all three multimeters.)

(*d*) Look at the meter needle.

1. If the needle swings to the far right over the "O" on the top scale (on all three multimeters), the circuit has continuity.

2. If the needle doesn't move, the circuit is open (broken).

3. If the needle jumps or flickers there is a loose connection in the circuit being tested.

(3) *Testing for shorts.* A short (or short circuit) occurs when two circuits that should not be connected have metal to metal contact with each other. A short also occurs when a circuit that should not touch ground has metal to metal contact with ground. To check for shorts, do the following steps:

(*a*) Set up and "zero" the multimeter (fig.11-2).

CAUTION

Failure to do the following step can damage the multimeter.

(*b*) Disconnect the circuit being tested. To be safe, disconnect the battery ground strap.

(*c*) With all three multimeters, connect one probe to one circuit and the other probe to the other circuit or ground (if checking for a short to ground). The example below (fig.11-4) shows a check to see if wire "A" is shorted to wire "B" in the wiring harness.

(*d*) Look at the needle.

1. If the needle swings to the far right over the "0" on the top scale (on all three multimeters), the circuits are shorted.

2. If the needle doesn't move, the circuits are not shorted.

3. If the needle jumps or flickers, the circuits are occasionally shorted.

(4) *Testing resistance.* To measure resistance in a circuit, do the following steps:

(*a*) Set up and "zero" the multimeter (fig. 11-2).

CAUTION

Failure to do the following step can damage the multimeter.

(*b*) Disconnect the circuit being tested. To be safe, disconnect the battery ground strap.

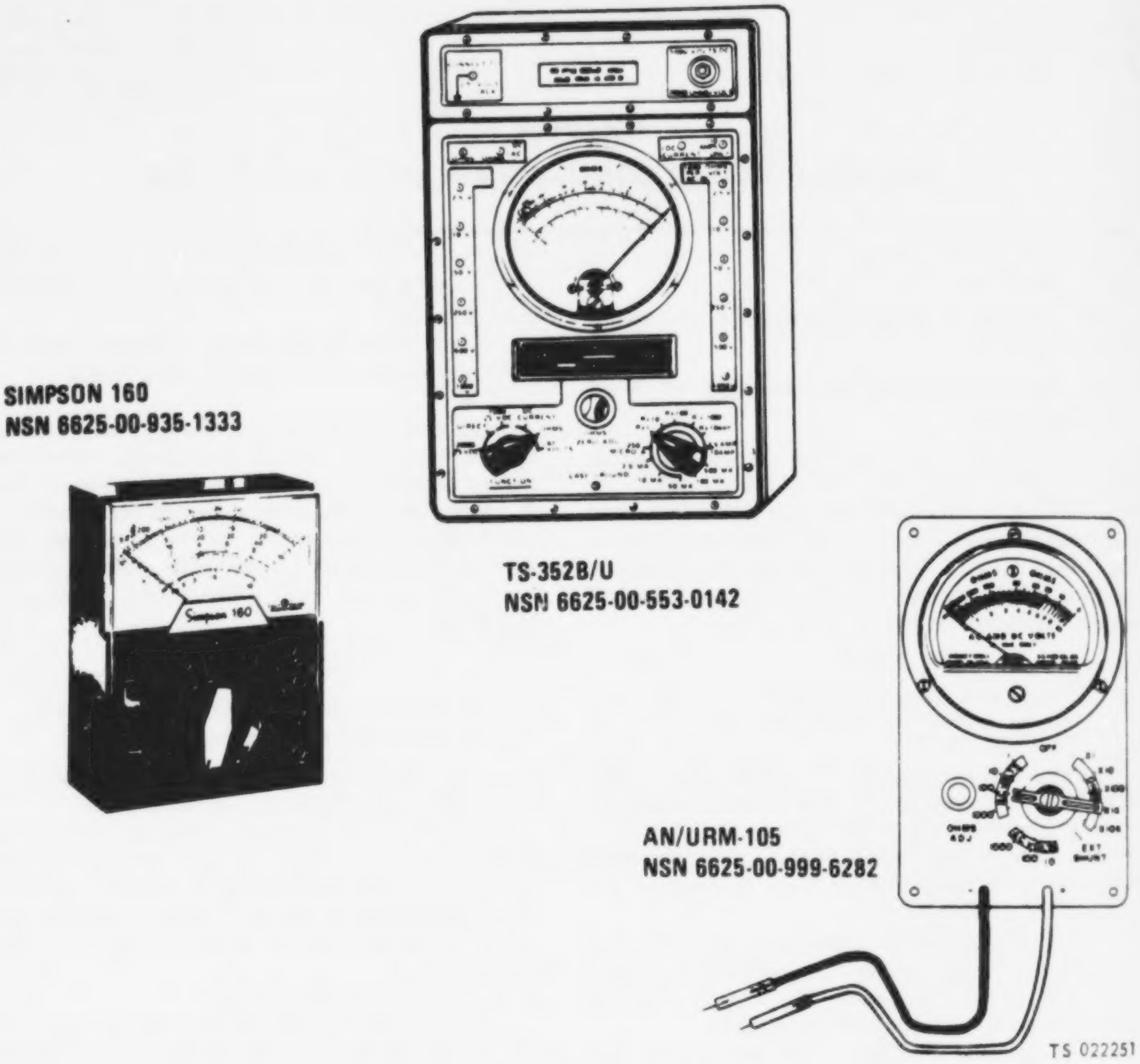

SIMPSON 160
NSN 6625-00-935-1333
Simpson 160
TS-352B/U
NSN 6625-00-553-0142
AN/URM-105
NSN 6625-00-999-6282
TS 022251

Figure 11-1. Types of Multimeters (TS 022251)

(*c*) If the test in this manual calls for an "ohms range" different that "RX1" or "X1", set the selector switch to that range (such as "RX10" or "X10").

NOTE

"Zero" the meter whenever you change ranges.

(*d*) With all three multimeters, connect the probes across the circuit or item to be measured. The example below (fig. 11-5) shows measuring the resistance of a temperature sending unit.

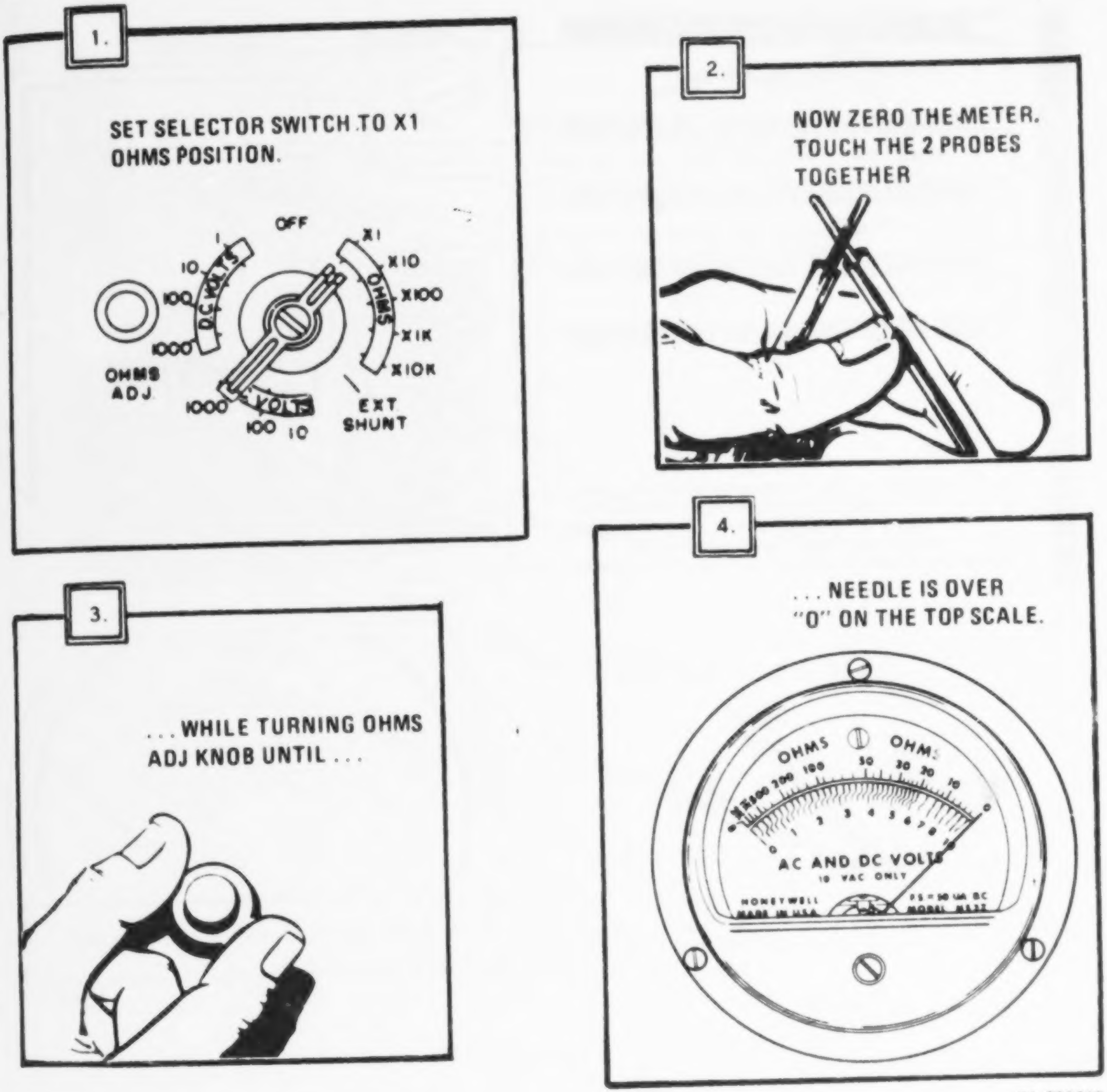
(*e*) Read the meter (fig. 11-6). If the meter switch is on the "RX1" or "X1" range, the reading is taken directly from the top scale. If the meter switch is on a different range, multiply the reading on the scale according to the information below.

Ohms Switch Setting	*You Do*
X1 or RX1	Read number on scale
X10 or RX10	Multiply reading by 10
X100 or RX100	Multiply reading by 100
X1K or RX1K	Multiply reading by 1,000
X10K or RX10K	Multiply reading by 10,000

(Remember: K = 1,000)

c. Using the DC Colts Scale (Fig.11-7). The DC volts scale is used to measure all voltages on the equipment except the 115 AC voltage.

AN/URM-105



1. SET SELECTOR SWITCH TO X1 OHMS POSITION.

OFF
1
10
100
1000
D.C. VOLTS
X1
X10
X100
X1K
X10K
OHMS
OHMS ADJ
1000
VOLTS
100
10
EXT SHUNT

2. NOW ZERO THE METER. TOUCH THE 2 PROBES TOGETHER

3. . . . WHILE TURNING OHMS ADJ KNOB UNTIL . . .

4. . . . NEEDLE IS OVER "0" ON THE TOP SCALE.

OHMS
OHMS
500
200
100
50
30
20
10
0
1
2
3
4
5
6
7
8
AC AND DC VOLTS
10 VAC ONLY
HONEYWELL
MADE IN USA
FS = 50 uA DC

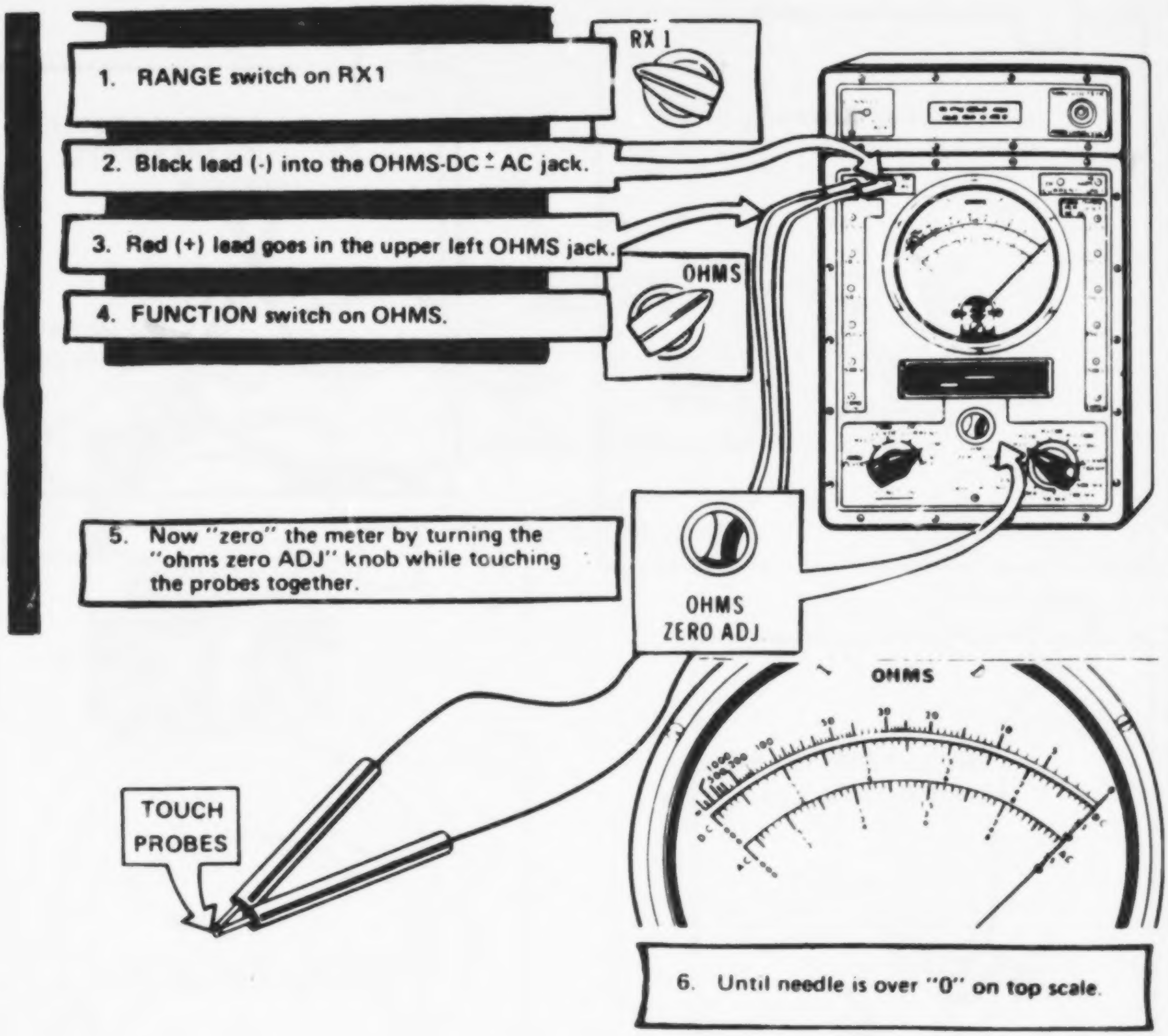
TS 022252

NOTE

If the needle will not "zero", replace the batteries. If the needle still will not "zero" after replacing the batteries, turn the meter in for repair.

Figure 11-2. Zeroing the Meter (Sheet 1 of 3) (TS 022252)

TS-352B/U



1. RANGE switch on RX1
2. Black lead (-) into the OHMS-DC ± AC jack.
3. Red (+) lead goes in the upper left OHMS jack.
4. FUNCTION switch on OHMS.
5. Now "zero" the meter by turning the "ohms zero ADJ" knob while touching the probes together.
6. Until needle is over "0" on top scale.

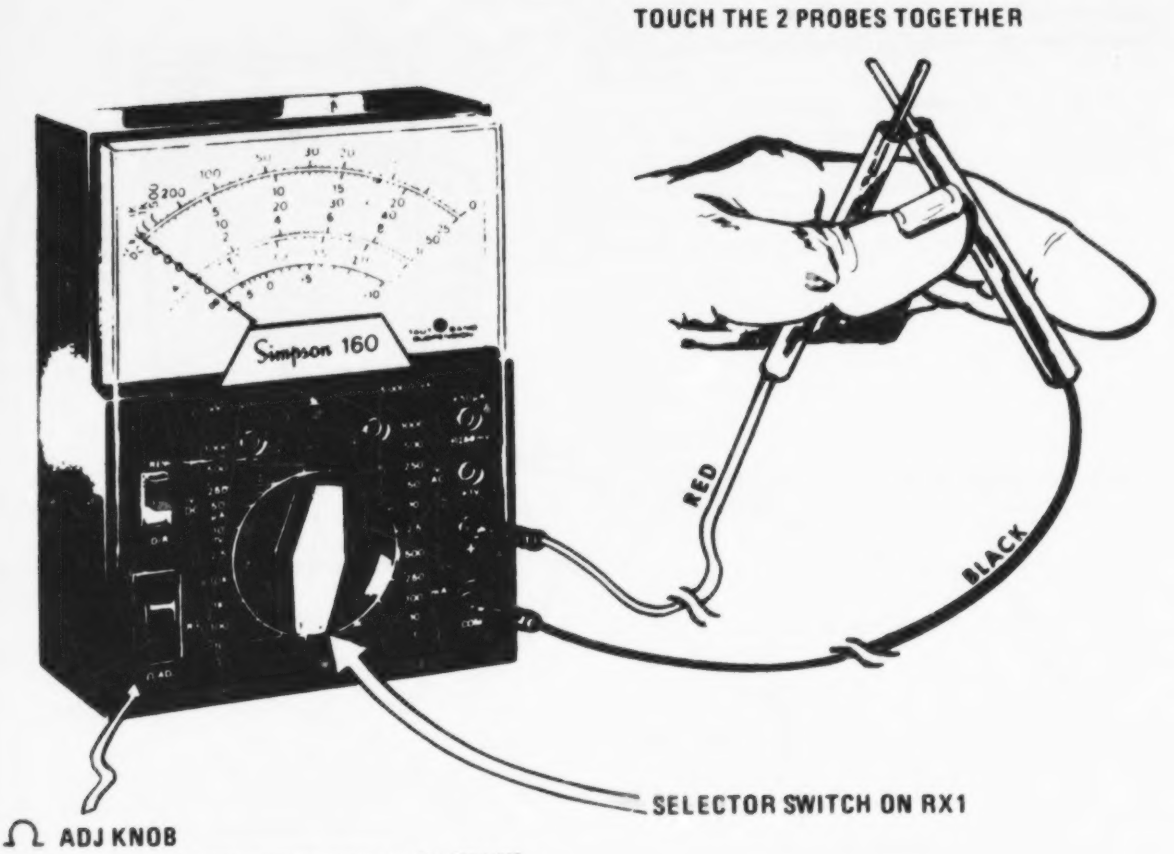
RX 1
OHMS
OHMS
ZERO ADJ
TOUCH
PROBES
OHMS
1000
500
200
100
50
30
20
10
DC
AC
DC

TS 022253

NOTE

If the needle will not "zero", replace the batteries. If the needle still will not "zero" after replacing the batteries, turn the meter in for repair.

Figure 11-2. Zeroing the Meter (Sheet 2 of 3) (TS 022253)



1. SET SELECTOR SWITCH ON "RX1".
2. PUT BLACK PROBE IN "COM–" JACK.
3. PUT RED PROBE IN "+" JACK.
4. WHILE TOUCHING THE PROBES TOGETHER, TURN "ΩADJ" KNOB UNTIL NEEDLE IS OVER THE "0" ON THE TOP SCALE.

TS 022254

NOTE

If the needle will not "zero", replace the batteries. If the needle still will not "zero" after replacing the batteries, turn the meter in for repair.

Figure 11-2. Zeroing the Meter (Sheet 3 of 3) (TS 022254)

(1) Before using the multimeter to measure DC voltage, do the following steps that match the multimeter you you have:

(*a*) *AN/URM-105.* Set meter switch to DC volts range given in TM. (To measure 24 volts DC, set switch on "100 DC Volts" range.)

1. Set FUNCTION switch to "DIRECT". (RANGE switch can be at any position.)

2. Put black lead in "-DC/+AC/OHMS" jack.

3. To measure 24 volts DC, plug red lead into "50V" jack on left side of meter. (If measuring less than 10 volts DC, use "10V" jack; if measuring less than 2.5 volts DC, use "2.5V" jack.)

(*c*) *Simpson 160.*

1. Connect black lead to "COM-" jack.

2. Connect red lead to "±" jack.

3. To measure 24 volts DC, set selector switch to "V/DC 50" position. (If measuring less than 10 volts DC, set selector switch to "V/DC 10"

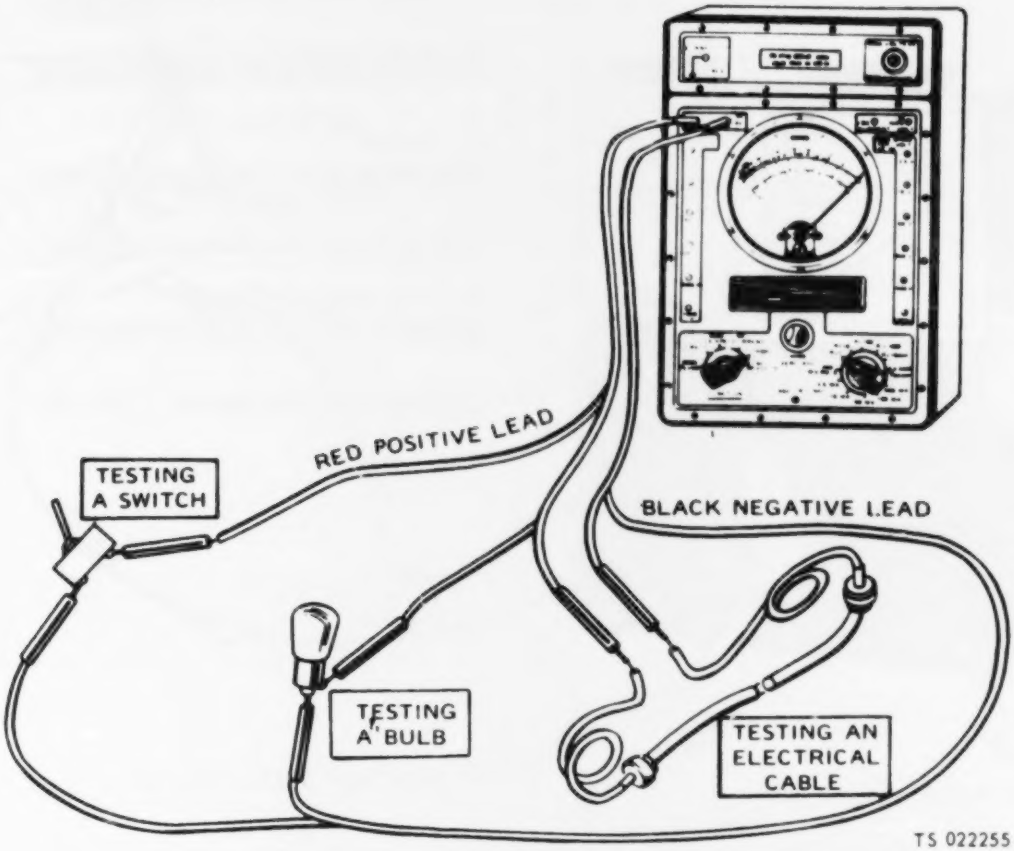

RED POSITIVE LEAD
TESTING A SWITCH
BLACK NEGATIVE LEAD
TESTING A BULB
TESTING AN ELECTRICAL CABLE
TS 022255

Figure 11-3. Continuity Test (TS 022255)

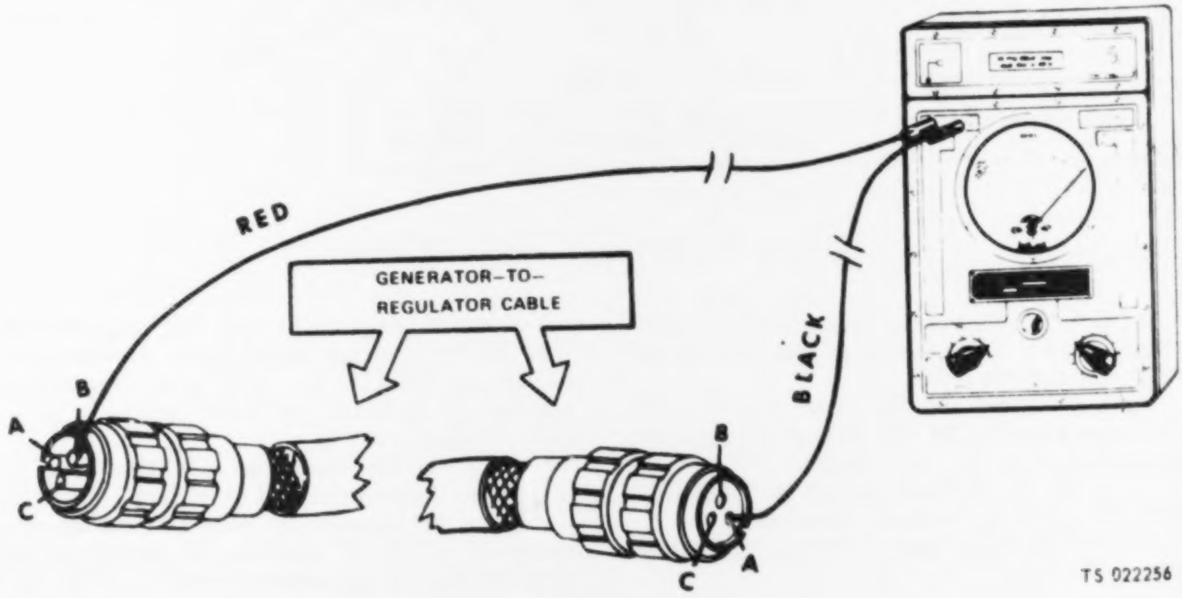

RED
GENERATOR-TO-REGULATOR CABLE
BLACK
A
B
C
B
C
A
TS 022256

Figure 11-4. Testing for Shorts (TS 022256)

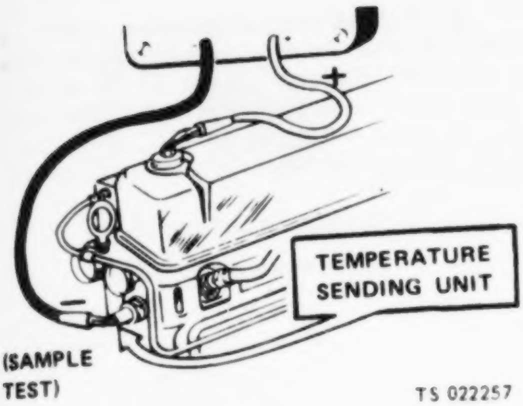


Figure 11-5. Testing Resistance (TS 022257)

position; if measuring less than 2.5 volts DC, set selector switch to "V/DC 2.5" position.)

4. Set polarity reversing switch to the "±DC" position.

(2) To measure DC volts, do the following steps:

(*a*) Set up multimeter (para (1) above).

NOTE

If you are unsure of the voltage to be measured on the equipment, *always* start on the highest range. This will protect the meter.

(*b*) With all three multimeters, connect the red probe to the positive (±) side of the circuit and the black probe to the negative (•) side. The example (fig. 11-8) shows 24 volts DC being measured across the batteries.

(*c*) *Read the meter.* (The examples (fig. 11-9, 11-10 and 11-11) show how to read all three multimeters.) If the needle tries to move off scale to the left, reverse the probes on the circuit.

1. Simpson 160. Read the "DC" volts scale for the range the selector switch is set at.

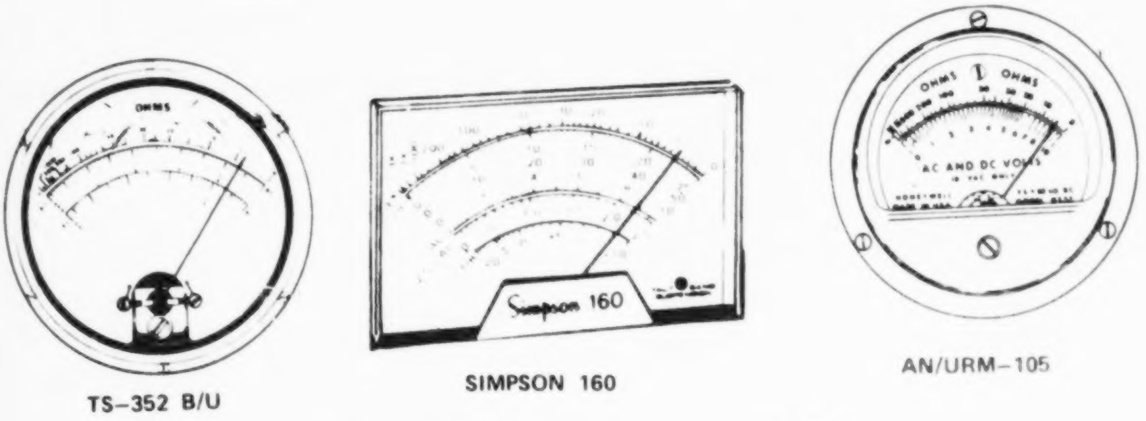
Switch Setting	Scale
V/DC 50	0-50
V/DC 10	0-10
V/DC 2.5	0-25 (and divide by 10)

Thus, the meter (fig. 11-9) is showing the following readings:

2. TS-352B/U. Read the "DC" volts scale for the range the red lead is plugged in at.

Range	Scale
50V	0-5 (and multiply by 10)
10V	0-10
2.5V	0-2.5

Thus, the meter (fig. 11-10) is showing the following readings:



TS-352 B/U

SIMPSON 160

AN/URM-105

OHMS SWITCH SETTING	READING
X1 OR RX1	4 OHMS
X10 OR RX10	40 OHMS
X100 OR RX100	400 OHMS

TS 022258

Figure 11-6. Reading the Ohm Scale (TS 022258)

3. AN/URM-105. Read the upper, black, straight-lined portion of the "AC and DC volts" scale for the range the selector switch is set at.

Switch Setting	*Scale*
1000 DC Volts	0-10 (and multiply by 100)
100 DC Volts	0-10 (and multiply by 10)
20 DC Volts	0-10
1 DC Volt	0-10 (and divide by 10)

Thus, the meter (fig. 11-11) is showing the following readings:

d. Using the AC Volts Scale. The AC volts scale is used to measure the AC voltage found in various places on the unit.

(1) Before using the multimeter to measure AC voltage, do the following steps that match the multimeter you have.

(*a*) *AN/URM-105.* Set meter switch to "1000 AC volts" (fig. 11-12).

(*b*) *TS-352B/U.*

1. Set "FUNCTION" switch to "AC volts". ("RANGE" switch can be at any setting.) (A, fig. 11-13.)

2. Put black lead in "-DC/+AC/OHMS" jack (B, fig. 11-13).

3. Put lead in "250V" jack on right side of meter.

(*c*) *Simpson 160 (fig. 11-14).*

1. Put black lead in "COM-" jack.

2. Put red lead in "+" jack.

3. Set selector switch to "V/AC 250" position.

(2) To measure 115 AC voltage, do the following steps:

(*a*) Set up multimeter (fig. 11-15).

(*b*) With all three multimeters, connect one probe to one side of the circuit and the other probe to the other side. The example (fig. 11-15) shows 115 volts AC being measured across an AC light circuit.

(*c*) Read meter on the "AC" scale. Figure 11-16 shows a reading of 115 volts on all meters.

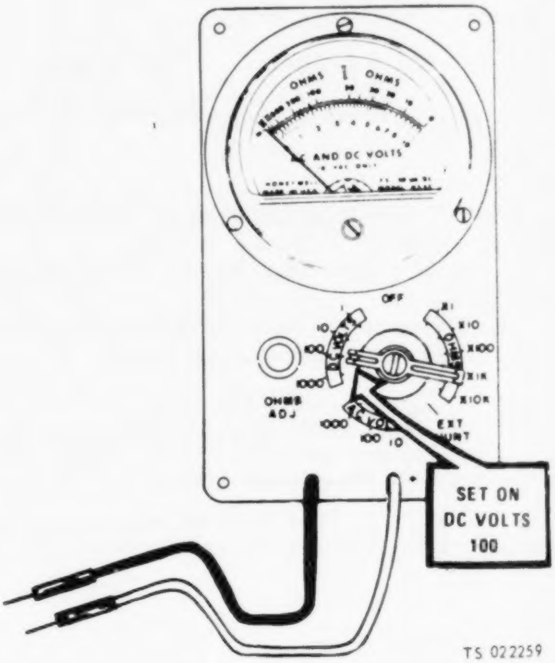


Figure 11-7. DC Volts Scale (Sheet 1 of 3) (TS 022259)

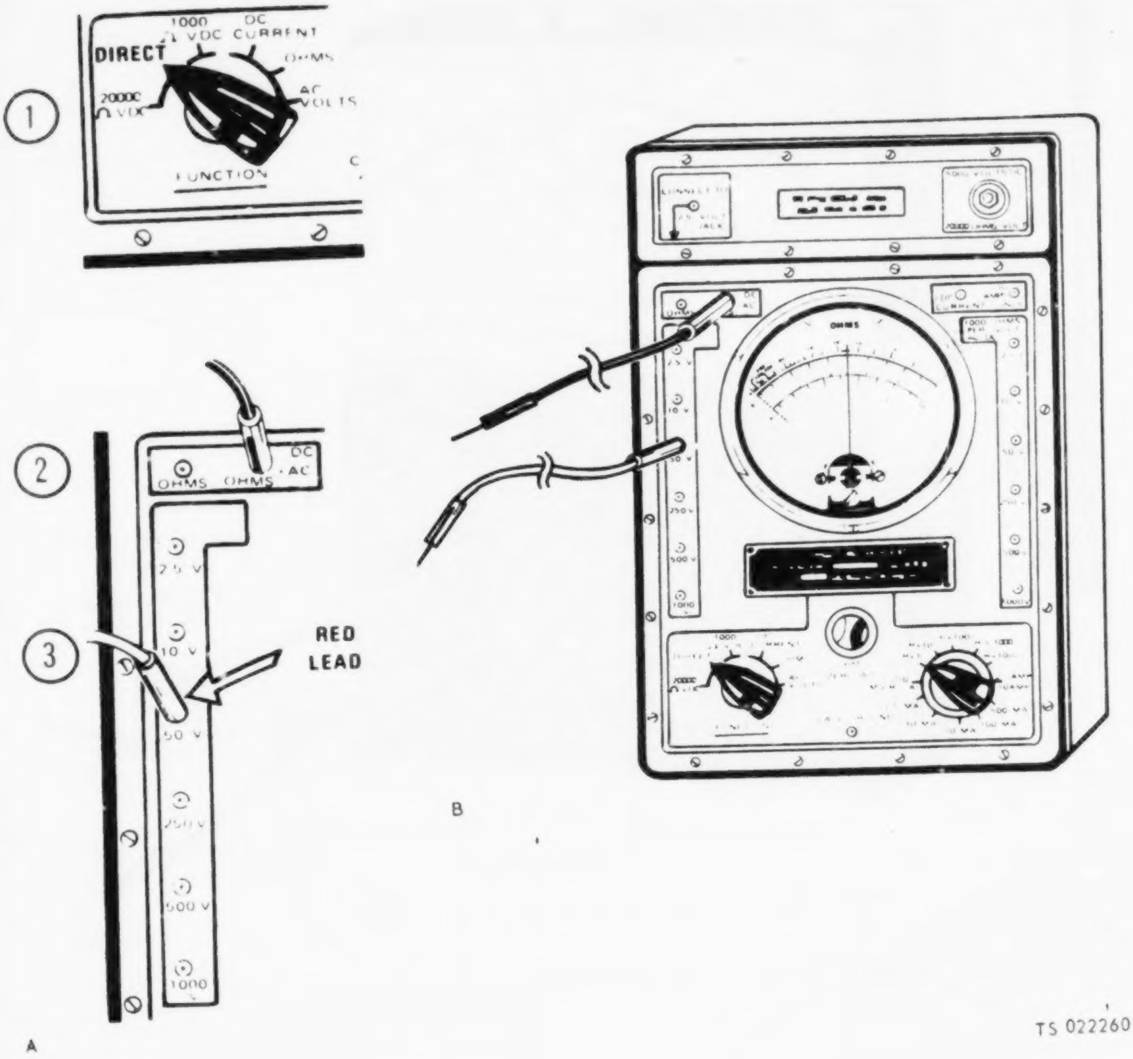
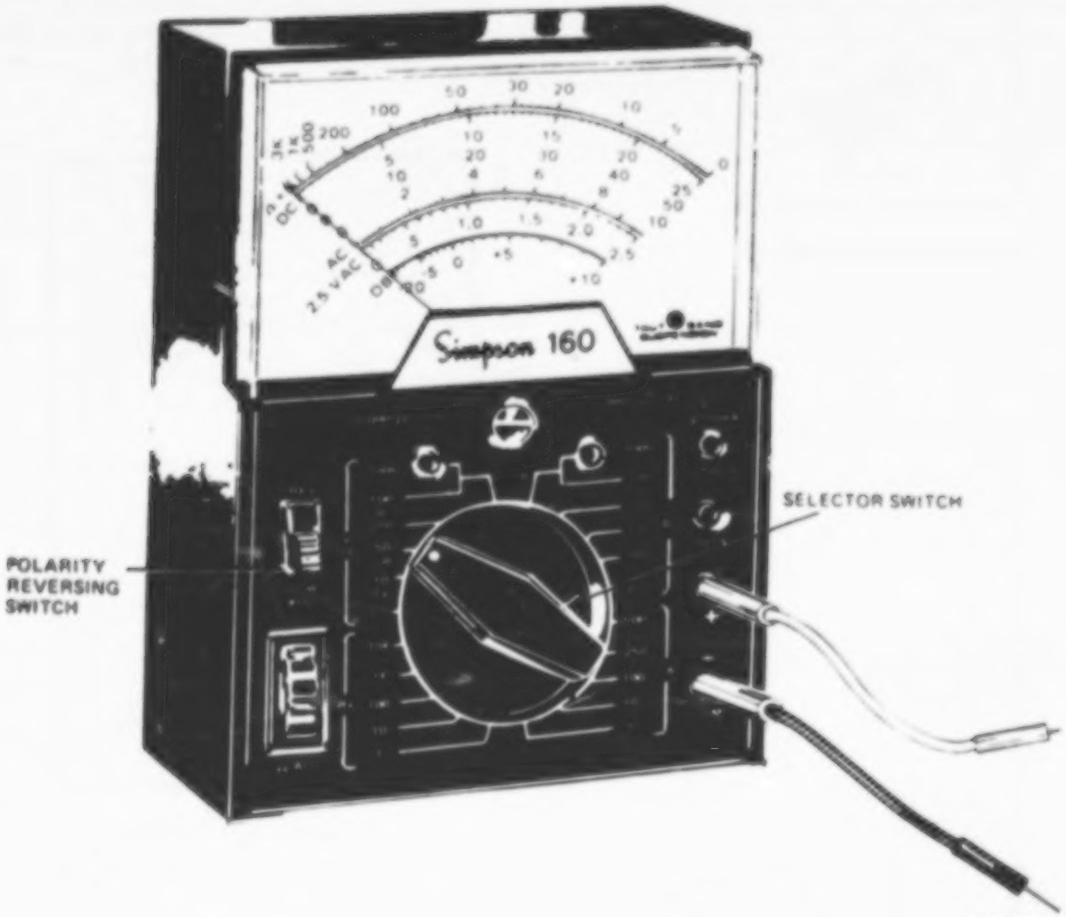
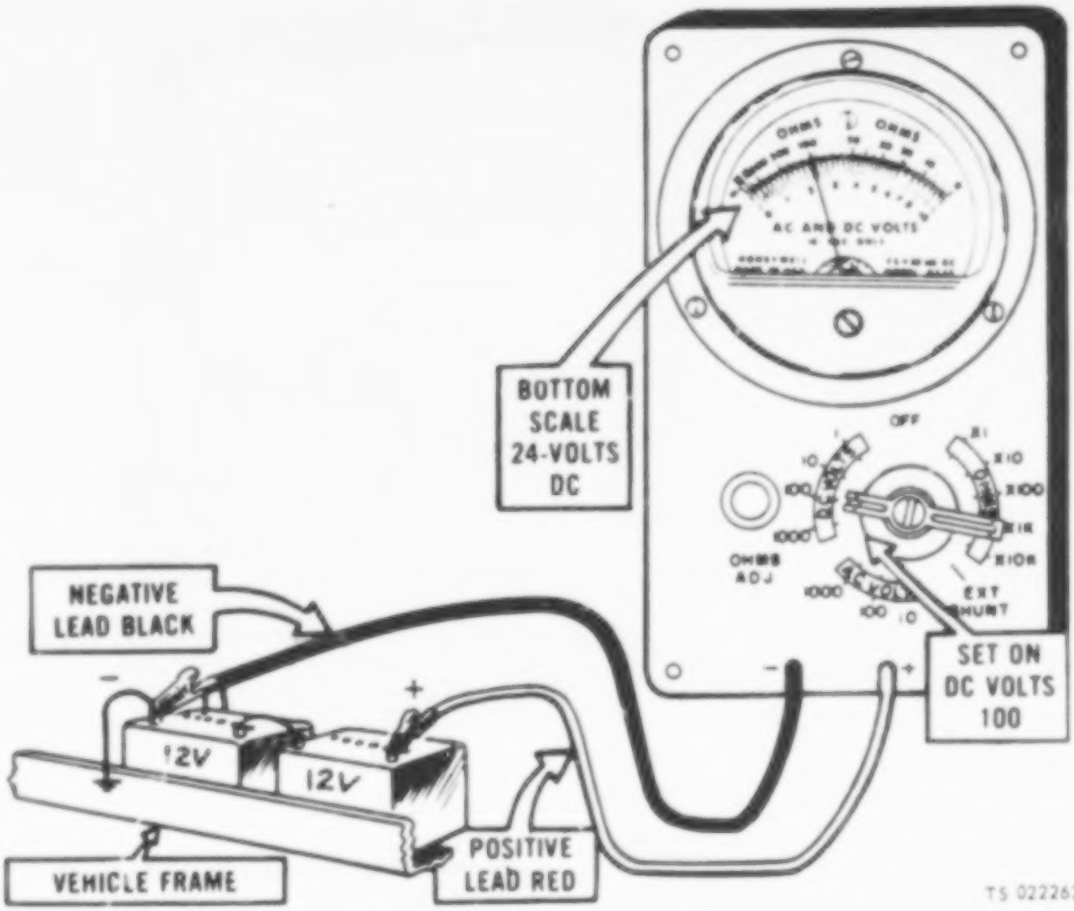

1
1000
DC
VDC CURRENT
DIRECT
OHMS
20000
Ω VDC
AC
VOLTS
FUNCTION
2
OHMS
OHMS
DC
AC
2.5 V
10 V
50 V
250 V
500 V
1000 V
3
RED
LEAD
A
B
TS 022260

Figure 11-7. DC Volts Scale (Sheet 2 of 3) (TS 022260)


Simpson 160
POLARITY
REVERSING
SWITCH
SELECTOR SWITCH

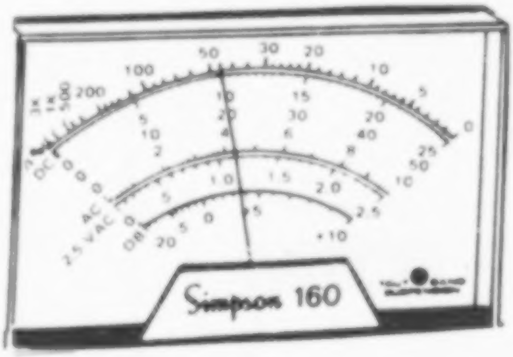
TS 022261

Figure 11-7. DC Volts Scale (Sheet 3 of 3) (TS 022261)


OHMS
OHMS
AC AND DC VOLTS
BOTTOM SCALE 24-VOLTS DC
OFF
1
10
100
1000
X1
X10
X100
X1K
X10K
OHMS ADJ
DC VOLTS
AC VOLTS
1000
100
10
EXT SHUNT
SET ON DC VOLTS 100
NEGATIVE LEAD BLACK
−
+
12V
12V
VEHICLE FRAME
POSITIVE LEAD RED

TS 022262

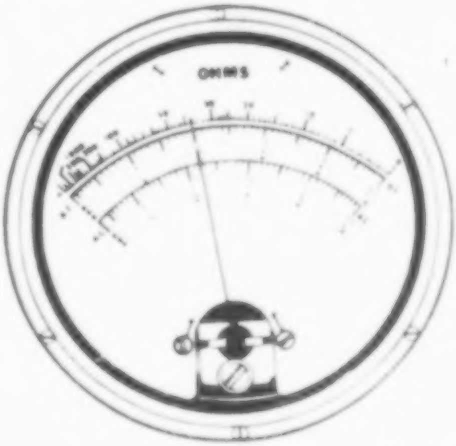
Figure 11-8. Measuring DC Voltage (TS 022262)


100
50
30
20
10
5
0
200
500
1K
2K
DC
AC
2.5 VAC
DB
Simpson 160

SWITCH SETTING	READING
V/DC 50	20 VOLTS DC
V/DC 10	4 VOLTS DC
V/DC 2.5	1 VOLT DC

TS 022263

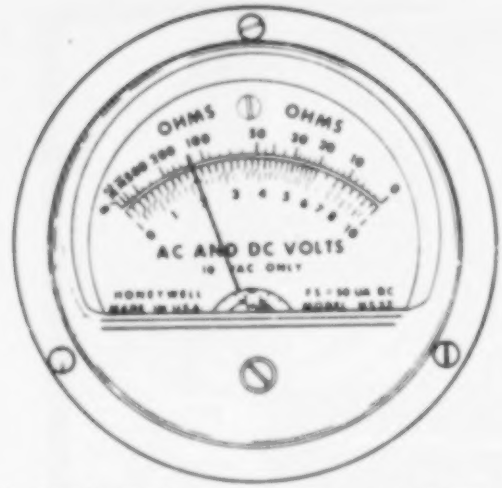
Figure 11-9. Reading DC Voltage (Simpson 160) (TS 022263)



RANGE	READING
50V	20 VOLTS DC
10V	4 VOLTS DC
2.5V	1 VOLT DC

TS 022264

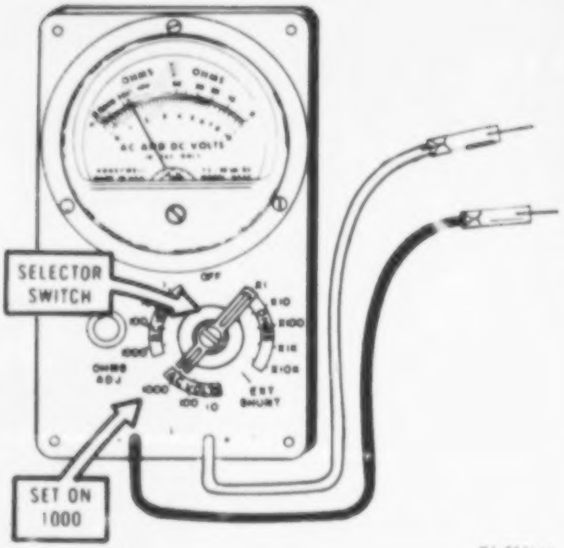
Figure 11-10. Reading DC Voltage (TS-352 B/U) (TS 022263)


OHMS
OHMS
AC AND DC VOLTS
10 AC ONLY
HONEYWELL
MADE IN USA

SWITCH SETTING	READING
100 DC VOLTS	20 VOLTS DC
10 DC VOLTS	2 VOLTS DC
1 DC VOLT	.2 VOLTS DC

TS 022265

Figure 11-11. Reading DC Voltage (AN/URM-105) (TS 022265)


SELECTOR SWITCH
SET ON 1000
OHMS
AC AND DC VOLTS
OFF
OHMS ADJ
EXT SHUNT

TS 022266

Figure 11-12. AC Volt Scale (AN/URM-105) (TS 022266)

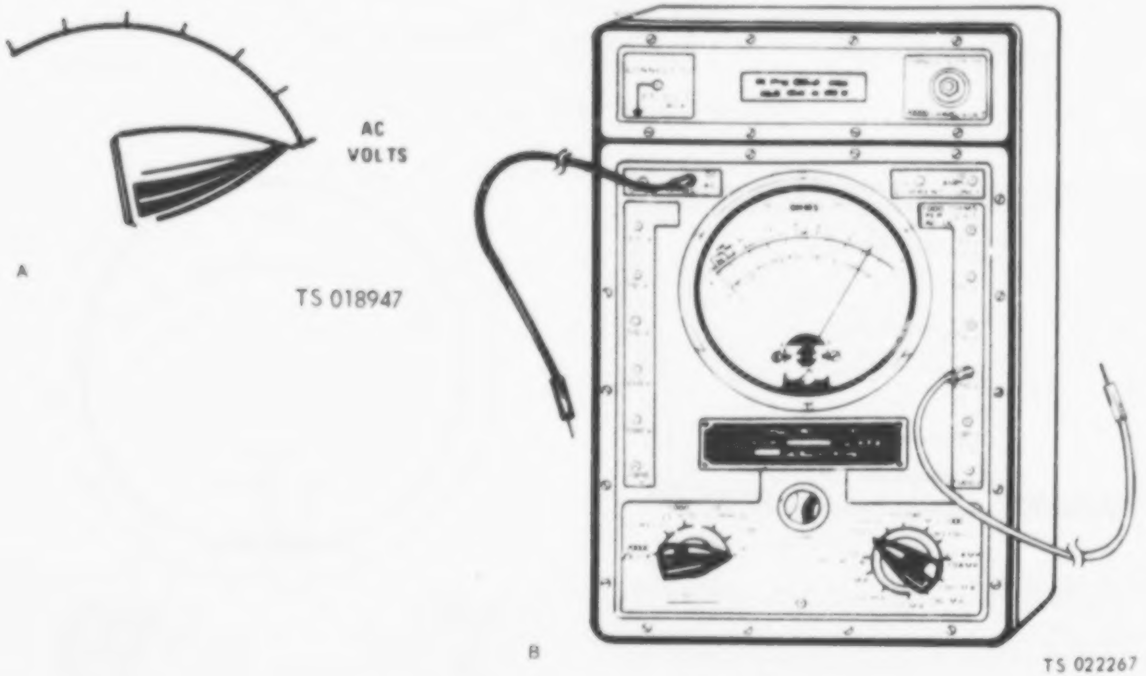

AC VOLTS
A
TS 018947
B
TS 022267

Figure 11-13. AC Volt Scale (TS-352 B/U) (TS 022267)

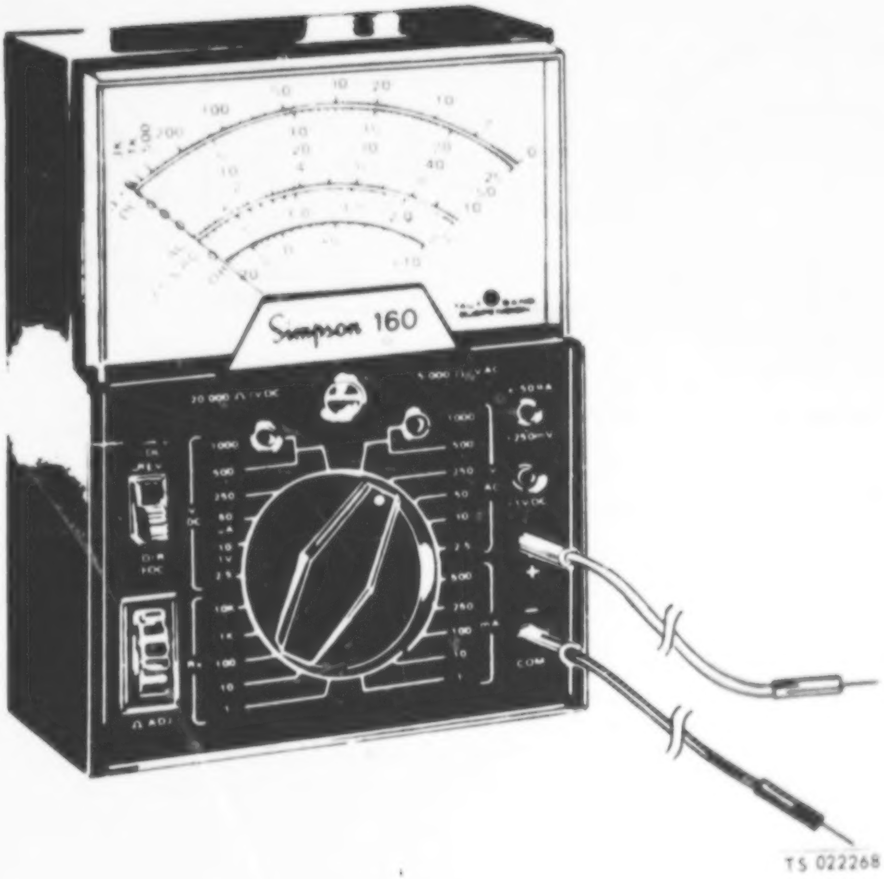

Simpson 160
TS 022268

Figure 11-14. AC Volt Scale (Simpson 160) (TS 022268)

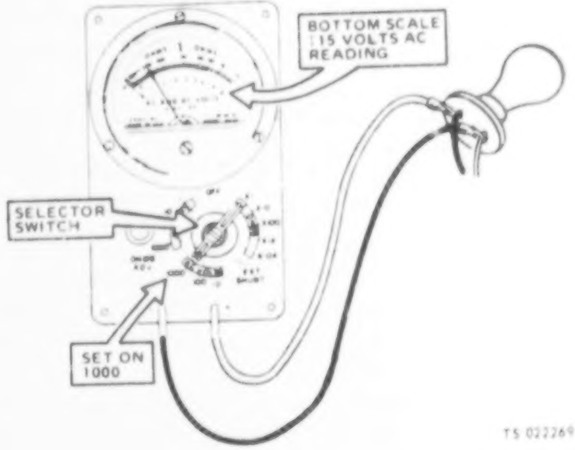
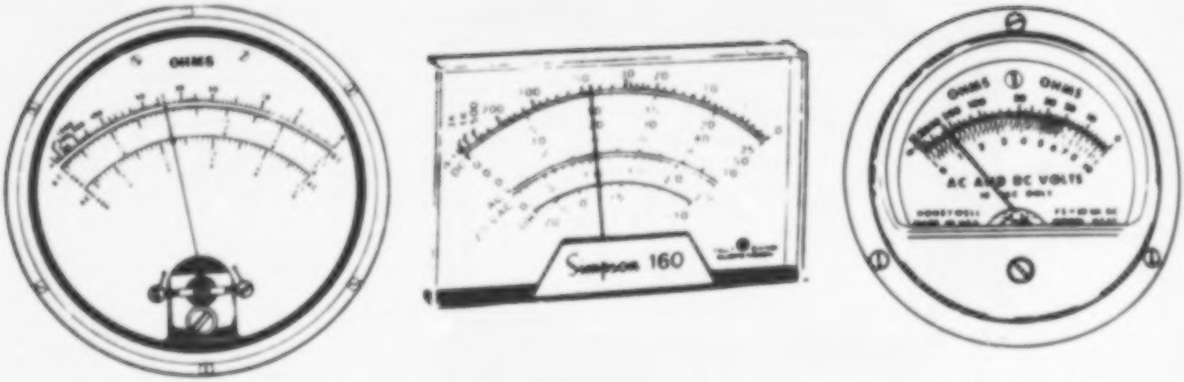

BOTTOM SCALE
115 VOLTS AC
READING
SELECTOR
SWITCH
SET ON
1000
TS 022269

Figure 11-15. Measuring AC Voltage (TS 022269)


OHMS
Simpson 160
OHMS
OHMS
AC AND DC VOLTS

TS-352 B/U

Simpson 160

AN/URM-105

TS 022270

Figure 11-16. Reading AC Voltage (TS 022270)

CHAPTER 12

ADMINISTRATIVE STORAGE

12-1. General

This chapter provides instructions for handling, shipment, and limited storage of the expandable shelter. Reference TM740-90-1 for additional data.

12-2. Handling

a. General. Handling of the shelter may be accomplished by crane hoist hooked to the lifting eyes on the shelter, wheeled transporter, and may be skidded for short distances. See figure 12-1 for location and identification of handling points and hardware. Perform the various handling operations as follows:

b. Hoisting. Attach a hoisting sling 7,500 pound (3,450 kg) minimum capacity to the four hoist rings (fig. 12-1). Secure hoisting sling to a crane or other hoisting device capable of hoisting a minimum of 9,000 pounds (4,050 kg) and hoist to the desired location.

WARNING

Do not use lifting equipment with capacity of less than 9,000 pounds (4,050 kg). Do not allow shelter to swing back and forth when it is suspended. Failure to observe this warning may result in damage to equipment or severe injury or death to personnel.

CAUTION

Do not attach hoisting sling to the lifting equipment in such a manner that the angle between any of the hoist lines and the top of the shelter is less than 45 degrees. Ang angle less than 45 degrees will cause an excessive strain, which could damage the shelter.

c. Wheeled Transporter. A wheeled transporter or mobilizer may be attached to the shelter to permit towing as follows:

(1) Separate transporter sections and prepare transporter for use observing all recommendations of transporter manufacture.

(2) Position transporter sections at ends of shelter adjacent to mobilizer brackets at ends of shelter (fig. 12-1).

(3) Position transporter brackets to connect with shelter brackets and secure transporter to shelter.

(4) Operate transporter according to transporter manufacturer's instructions to raise shelter to towing height.

(5) Connect towing equipment to transporter tow bar or manually move shelter to desired position.

(6) When shelter is in desired position, operate transporter to lower shelter and remove transporter sections.

d. Skidding. Attach a cable or chain sling to towing rings identified on the shelter and shown in figure 12-1 and connect to suitable equipment for skidding the shelter.

CAUTION

Limit skidding of the shelter to short distances over smooth level terrain to prevent damage to shelter skids.

12-3. Preparation of Equipment for Shipment

a. Inspection. Examine the item for any unusual conditions such as damage or missing components. Inspect the item in accordance with steps outlined in Weekly Preventive Maintenance Services. Deficiencies and shortcomings along with corrective action taken will be recorded on DA Form 2404 (TM 38-750).

b. Preparation for Shipment. The following items shall be performed prior to folding the shelter for shipment.

(1) Drain all water from equipment in shelter.

(2) Disconnect dual water hose assembly from water service box and from water outlet box as applicable. If provided, disconnect heater receptacle. Drain and store hoses. Install covers on all connections and on hose assemblies.

(3) Disconnect telephone inlet line from telephone jack.

(4) Disconnect 400 Hertz and 60 Hertz cables from power inlet receptacles and from power outlet box as applicable. Disconnect emergency light

power supply, if indicated. Store cables and power supply.

(5) If applicable, disconnect surgery light power supply and humidistat.

(6) Detach, disassemble, and stack for storage all Medical Corps equipment in accordance with instructions on instruction placard located on inside of access door. Secure equipment with applicable tie down apparatus in accordance with instructions placard.

(7) Disconnect and store conditioned air system components.

c. Marking. Marking shall be in accordance with MIL-STD-129.

d. Shipment. The expandable shelter may be transported by airplane helicopter, ship, truck, or train. Various tie down and hoisting rings identified on the shelter and shown in figure 12-1 may be used to secure the shelter to the transport equipment. Refer to Association of American Railroads Rules

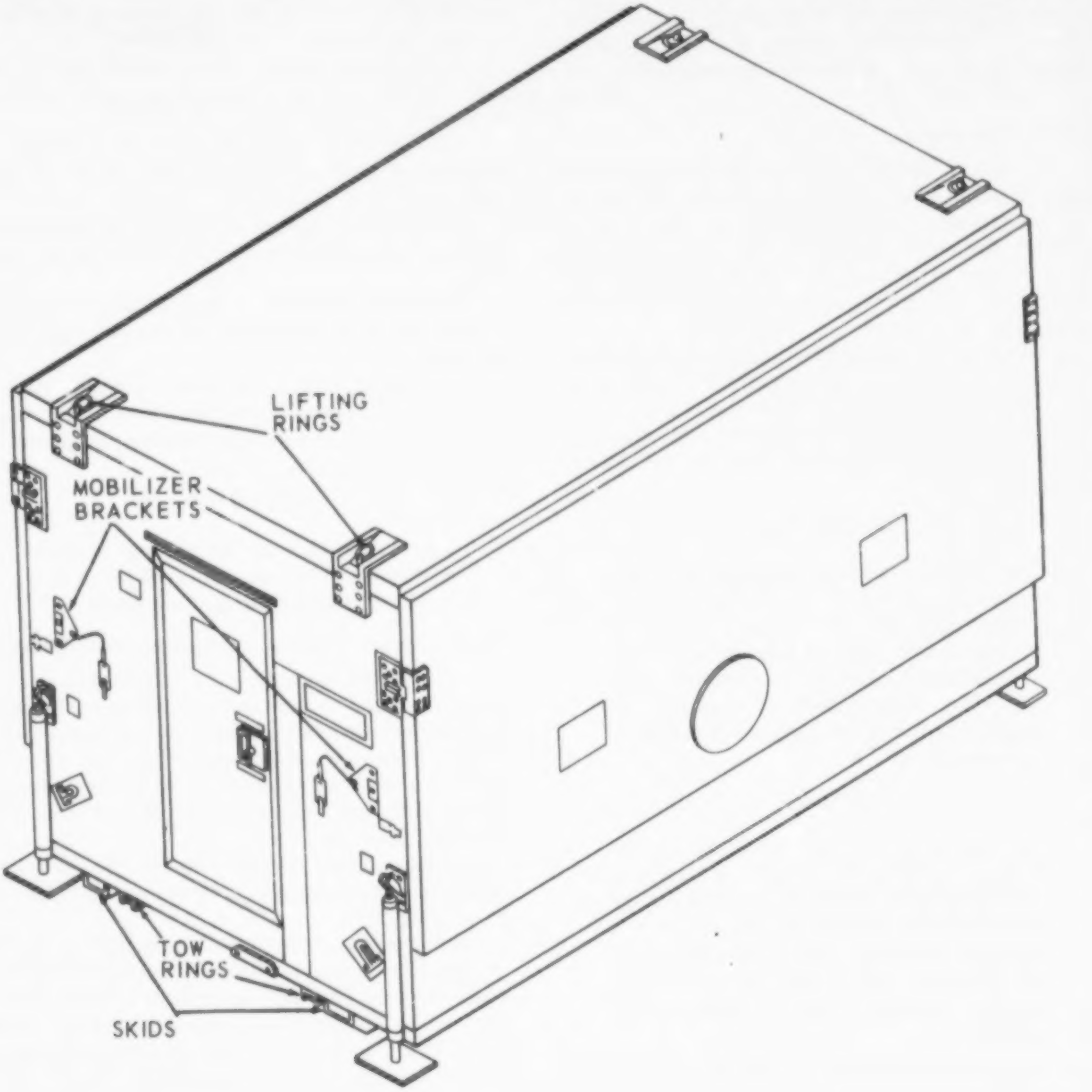


Figure 12-1. Shelter Handling Points (TS 013857)

Governing the Loading of Commodities on Open Top Cars (sec. 4, fig. 1A) for blocking and tie down procedures when shipment is by railroad flatcar.

CAUTION

Position shelter with skid base parallel to the longitudinal axis of the carrier to prevent excessive side loads on the skids. Make sure the carrier and restraining methods are capable of supporting a weight of 9,000 pounds (4,050 kg) minimum.

12-4. Limited Storage

a. General. Every effort should be made to provide covered storage for the expandable shelter. If this is impossible, select a firm, level, well-drained storage location, protected from prevailing winds. Position the shelter on heavy planking. Cover the shelter with a tarpaulin or other suitable waterproof covering and secure in a manner that will provide the shelter maximum protection from the elements.

b. Inspection. Examine the item for any unusual conditions such as damage or missing components. Inspect the item in accordance with steps outlined in Weekly Preventive Maintenance Services. Deficiencies and shortcoming along with corrective action will be recorded on DA Form 2404 (TM38-750).

c. Preparation for Limited Storage. The following items shall be performed prior to folding the shelter for limited storage.

(1) Drain all water from equipment in shelter.

(2) Disconnect dual water hose assembly from water service box and from water outlet box as applicable. If provided, disconnect heater receptacles on hoses from power receptacles. Drain and store hoses. Install covers on all connections and on hose assemblies.

(3) Disconnect telephone inlet line from telephone jack.

(4) Disconnect 400 Hertz and 60 Hertz cables from power inlet receptacles and from power outlet box as applicable. Disconnect emergency light power supply, if indicated. Store cables and power supply.

(5) If applicable, disconnect surgery light power supply and humidistat.

(6) Detach, disassemble, and stack for storage all Medical Corps equipment in accordance with instructions on instruction placard located on inside of access door. Secure equipment with applicable tie down apparatus in accordance with instructions placard.

(7) Disconnect and store conditioned air system components.

d. Inspection and Maintenance of Equipment in Limited Storage. After equipment has been placed in limited storage, suspend all regularly scheduled preventive maintenance services and inspect as specified herein. Visual inspection of the shelter in limited storage must consist of at least a walk-around examination of the equipment to observe any deficiencies that may have occurred. Inspect equipment in open storage weekly and that in covered storage monthly. Immediately after any severe storm or environmental change inspect all equipment. Record all deficiencies and shortcomings together with corrective action taken, on DA Form 2404. Keep equipment in an optimum state of readiness. Accomplish required services and repairs as expeditiously as possible. Whenever possible, perform all maintenance "on-site". To assure utilization of all assigned materiel, rotate shelters in accordance with any rotational plan that will keep equipment in an operational condition and reduce maintenance effort.

APPENDIX A
REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers for Army Use.

A-2. Preventive Maintenance

DA Pam 738-750.	Army Maintenance Management System
Fed. Std. 750-Stitch	Seam and Stitching
Specification MIL-S-6872	Soldering Process
Specification QQ-S-571	Solder
FED. STD. 595	Painting
Specification TT-E-527	Enamel Paint
Specification MIL-T-704	Treatment and Painting
MIL-S-6872	Soldering Process
TM 740-90-1	Administrative Storage for Equipment
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-461A	Electromagnetic Interference Characteristics Requirements for Equipment
TM 9-2865	Repair of Slide Fasteners

A-3. Technical Manuals

TM 9-2330-275-14&P	Operator's, Organizational, DS and GS Maintenance Manual (including repair parts list): Dolly set, lift transportable shelter.
TM 10-5410-221-24P	Org., Direct and General Support Maintenance Repair Parts and Special Tools List: Shelter, Expandable, Rigid Construction with Air Lock.
TM 750-244-3	Destruction of Army Materiel to Prevent Enemy Use.

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component and the work measurement time required to perform the functions by the designated maintenance level. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the tools and test equipment required for each maintenance function as referenced from section II.

B-2. Explanation of Columns in Section II

a. Column (1). Group Number. Column 1 lists group numbers to identify related components, assemblies, sub-assemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

b. Column (2). Component/Assembly. This column contains the noun names of components, assemblies, sub-assemblies and modules for which maintenance is authorized.

c. Column (3). Maintenance Functions. This column lists the functions to be performed on the item listed in column 2.

The maintenance functions are defined as follows:

(1) *Inspect.* To determine serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

(2) *Test.* To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

(3) *Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminated), to preserve, to drain, to paint or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

(4) *Adjust.* To maintain within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

(5) *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

(6) *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

(7) *Install.* The act of emplacing, seating, or fixing into position an item, part or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

(8) *Replace.* The act of substituting a serviceable like type part, sub-assembly, or module (component or assembly) for an unserviceable counterpart.

(9) *Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, sub-assembly, module (component or assembly), end item, or system.

(10). *Overhaul.* That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (e.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

(11). *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

d. Column (4). Maintenance Category. This column is made up of subcolumns for each category of maintenance. Work time figures are listed in these subcolumns for the lowest level of maintenance authorized to perform the function listed in Column 3. These figures indicate the average active time required to perform the maintenance functions at the indicated category of maintenance under typical field operating conditions.

e. Column (5). Tools and Equipment. This column is provided for referencing by code, the common tool sets (not individual tools) special tools, test and support equipment required to perform the designated function.

B-3. Explanation of Columns in Section III

a. Column (1), Reference Code. This column consists of an arabic number listed in sequence from column 5 of section II. The number references the common tool sets, special tools and test equipment requirements.

b. Column (2), Maintenance Category. This column shows the lowest category of maintenance authorized to use the special tools or test equipment.

c. Column (3), Nomenclature. This column lists the name or identification of the common tool sets, special tools or test equipment.

d. Column (4), National/Nato Stock No. (NSN). This column is provided for the NSN of common tool sets, special tools and test equipment listed in the nomenclature column.

e. Column (5), Tool Number. This column lists the manufacturer's code and part number of tools and test equipment.

Section II. MAINTENANCE ALLOCATION CHART

(1)	(2)	(3)	(4)					(5)
			Maintenance category*					
Group number	Component Assembly	Maintenance function	C	O	F	H	D	Tools and equipment
01	ELECTRICAL EQUIPMENT Electrical Equipment	Inspect	1.5					
		Test	1.5					
		Service	1.0					1
		Replace		8.0				1
		Repair	6.0					1
02	HYDRAULIC FLUID, AIR & VACUUM SYSTEM Vacuum	Inspect	0.5					
		Test	0.5					
		Service	0.5					1
		Replace		2.0				1
		Repair	1.0					1
03	REFRIGERATION & AIR CONDITIONING COMPONENTS Air Conditioning Sytem	Inspect	1.0					
		Test	1.0					
		Service	7.0					1
		Replace			4.0			1
		Repair		2.0				1
04	TENTAGE, EQUIPMENT & SPECIAL PURPOSE CLOTHING COMPONENTS Shelter Body Assembly	Inspect		2.0				
		Test		2.0				
		Service		4.0				1,2
		Replace		16.0				1,2
		Repair		16.0				1,2
	Shelter Accessories	Inspect		2.0				
		Test		2.0				
		Service		4.0				1,2
		Replace		16.0				1,2
		Repair		16.0				1,2
05	PUMPS Water Discharge System	Inspect		0.5				
		Test		0.5				
		Service		0.5				
		Replace		2.0				1
		Repair		2.0				1

*SUBCOLUMNS ARE AS FOLLOWS: C - OPERATOR/CREW; O - ORGANIZATIONAL;
F - DIRECT SUPPORT; H - GENERAL SUPPORT; D - DEPOT

**Indicates WT/MH REQUIRED

(1)	(2)	(3)	(4)					(5)
Group number	Component Assembly	Maintenance function	Maintenance category*					Tools and equipment
			C	O	F	H	D	
06	JACK, LEVELING ASSEMBLY							
	Jack Assembly	Inspect		0.5				
		Replace		0.5				1
		Repair			2.0			1
07	WATER SUPPLY SYSTEM							
	Water Supply System	Inspect		0.5				
		Test		0.5				
		Service		0.5				1
		Replace		2.0				1
		Repair		2.0				1
08	REPAIR KIT							
	Repair Kit, MUST Expandable Shelter	Inspect		0.5				
		Replace		0.5				
		Repair		0.5				1

*SUBCOLUMNS ARE AS FOLLOWS: C - OPERATOR/CREW: O - ORGANIZATIONAL
F - DIRECT SUPPORT: H - GENERAL SUPPORT: D - DEPOT
**Indicates WT/MH REQUIRED

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference code	(2) Maintenance category	(3) Nomenclature	(4) National stock number (NSN)	(5) Tool number
1	O,F,H	Tool Kit, General Mechanic's	5180-00-177-7033	
2	O,F,H	Riveter, Blind, Hand	5120-00-017-2849	

APPENDIX C
COMPONENTS OF END ITEMS LIST

Section I. INTRODUCTION

1. Scope

This Appendix lists integral components of, and basic issue items for, the Shelter, Expandable to help you inventory items required for safe and efficient operation.

2. General

The components of end item list are divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the Shelter, Expandable and must accompany it whenever it is transferred or turned in. These illustrations will help you identify these items.

b. Section III. Basic Issue Items. These are minimum essential items required to place the Shelter, Expandable in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the Shelter, Expandable during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on Table(s) of Organization and Equipment (TOE/Modification Table of Organization and Equipment (MTOE) authorization of the end item.

3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) **Figure Number.** Indicates the figure number of the illustration on which the item is shown (if applicable).

(2) **Item Number.** The number used to identify item called out in the illustration.

b. National Stock Number (NSN). Indicates the national stock number assigned to the item and which will be used for requisitioning.

c. Part Number (P/N). Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

d. Description. Indicates the federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used in this list are:

CODE	*USED ON*
(Not applicable)	

g. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

h. Quanitty. This column is left blank for use during inventory. Under the Rcv'd column, list the quantity you actually receive on your major item. The Date columns are for use when you inventory the major item at a later date, such as for shipment to another site.

Section II. INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8) QUANTITY			
(a) FIGURE NO.	(b) ITEM NO.	NATIONAL STOCK NO.	PART NO. & FSCM	DESCRIPTION	LOCATION	USABLE ON CODE	QTY REQD	RCVD	DATE	DATE	DATE
9-2		5410-00-434-6201	5-4-1600(81337)	Air Lock Assy: C/O Door Assy: 3 Bow Assys W/14 Ropes and 14 Slips			1				
9-2	7	8340-00-935-6627	5-4-1570-1 (81337)	Spike Bow			6				
9-2	6	8340-00-823-7451	MIL-P-501 Type II(81349)	Tent Pin (12 In Lg)			8				
9-2	5	4030-00-972-2670	MIL-A-3962 Type I Size 4GR Style I(81349)	Ground Anchor Assy. 4 In (with cable)		*	14				
4-6		5120-00-970-6412	MIL-A-3962 Size 4(81349)	Driving Rod (36 In Lg)		*	1				
4-6		4030-00-541-4048	MIL-A-3962 Size 4(81349)	Driving Head (2¼ In Lg)		*	1				
4-6		5120-00-134-4725	MIL-A-3962 (81349)	Holding Handle			1				
4-19		5410-01-159-4421	5-4-1640(81337)	Air Lock Adapter			1				
2-8		5410-00-022-2653	5-4-2114(81337)	Air Duct Assys			2				
4-6		5410-00-434-6301	5-4-2047-27-19	Base Plate (for Folding Floor Jacks)			4				
4-3		4730-00-080-3382	5-4-2020(81337)	Drain Hose			1				
4-7	1	5340-00-042-8664	5-4-1661(81337)	Strap Assys (Tie-Down)			4				
4-7	2	5410-00-018-7538	5-4-1662(81337)	Web Net Assy			1				
4-7	3	5410-00-018-7541	5-4-1663(81337)	Rope Net Assy			1				
4-18		5410-00-807-5811	5-4-2013(81337)	Adapter Duct (with 1 ea cover and 2 ea couplings on each adapter).			2				
4-6		5410-00-022-2673	5-4-2015(81337)	Plenum Assy. Air Duct			1				

*Some units may hve 6 in. ground anchors and driving equip. which have been replaced by the items listed herein.

Section II. INTEGRAL COMPONENTS OF END ITEM (Cont'd)

(1) ILLUSTRATION (a) FIGURE NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) NATIONAL STOCK NO.	(3) PART NO. & FSCM	(4) DESCRIPTION	(5) LOCATION	(6) USABLE ON CODE	(7) QTY REQD	(8) QUANTITY RCVD	(8) QUANTITY DATE	(8) QUANTITY DATE	(8) QUANTITY DATE
4-6		6150-00-467-2541	13217E3983 (97403)	Cable 60 HZ			1				
4-6		6150-00-836-8595	13217E3982 (97403)	Cable 400 HZ			1				
4-9		5410-00-466-7429	5-4-2011-31 (81337)	Tread Plate Lower			1				
4-9		5410-00-466-7438	5-4-2011-32 (81337)	Tread Plate Upper			1				
4-5		5410-00-118-1234	5-4-1650-1 (81337)	Bellows Assy			1				
4-3		6210-00-473-9834	5-4-1605-8-2 (81337)	Light Assy, Air Lock with 25 foot cable and a lamp			1				
		4720-00-574-7902	5-4-2052(81337)	Hose Vacuum			1				
4-3		4720-00-042-4270	5-4-2014(81337)	Hose Dual Water			1				
4-6		5410-00-022-2670	5-4-2068(81337)	Support Assys Roof			4				
4-6		5410-00-440-9971	5-4-2150-8-70	Flange Assys(Air Duct)			2				
4-21	5	5410-00-022-2669	5-4-2047-26 (81337)	Jack Assy (Fixed Floor)			4				
4-21	10	5410-00-022-2671	5-4-2047-27 (81337)	Jack Assy (Folding Floor)			4				
				NOTE: 4 Jack Assys with wrenches and 4 base plates are mounted on fixed portion of shelter. 4 Jacks with wrenches are inside the shelter attached to the two folding floors. The base plates for the folding floor jacks are stored inside the shelter. during transport mode. The roof supports (4 ea) are also stored inside the shelter during transport modes. The flange assys are req to hold air duct covers closed during transport and storage.							

Section III. BASIC ISSUE ITEMS

(1) ILLUSTRATION		(2) NATIONAL STOCK NO.	(3) PART NO. & FSCM	(4) DESCRIPTION	(5) LOCATION	(6) USABLE ON CODE	(7) QTY REQD	(8) QUANTITY			
(a) FIGURE NO.	(b) ITEM NO.							RCVD	DATE	DATE	DATE
				TM 10-5410-221-14/1 OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL							
				TM 10-5410-221-24P ORGANIZATIONAL, DIRECT AND GENERAL SUPPORT MAINTENANCE MANUAL							

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TEAR ALONG DOTTED LINE

FOLD BACK

REVERSE OF DA FORM 2028-2 (TEST)

Charts Transposed to

End of Volume.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram ‡ 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 diciliters = 33.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

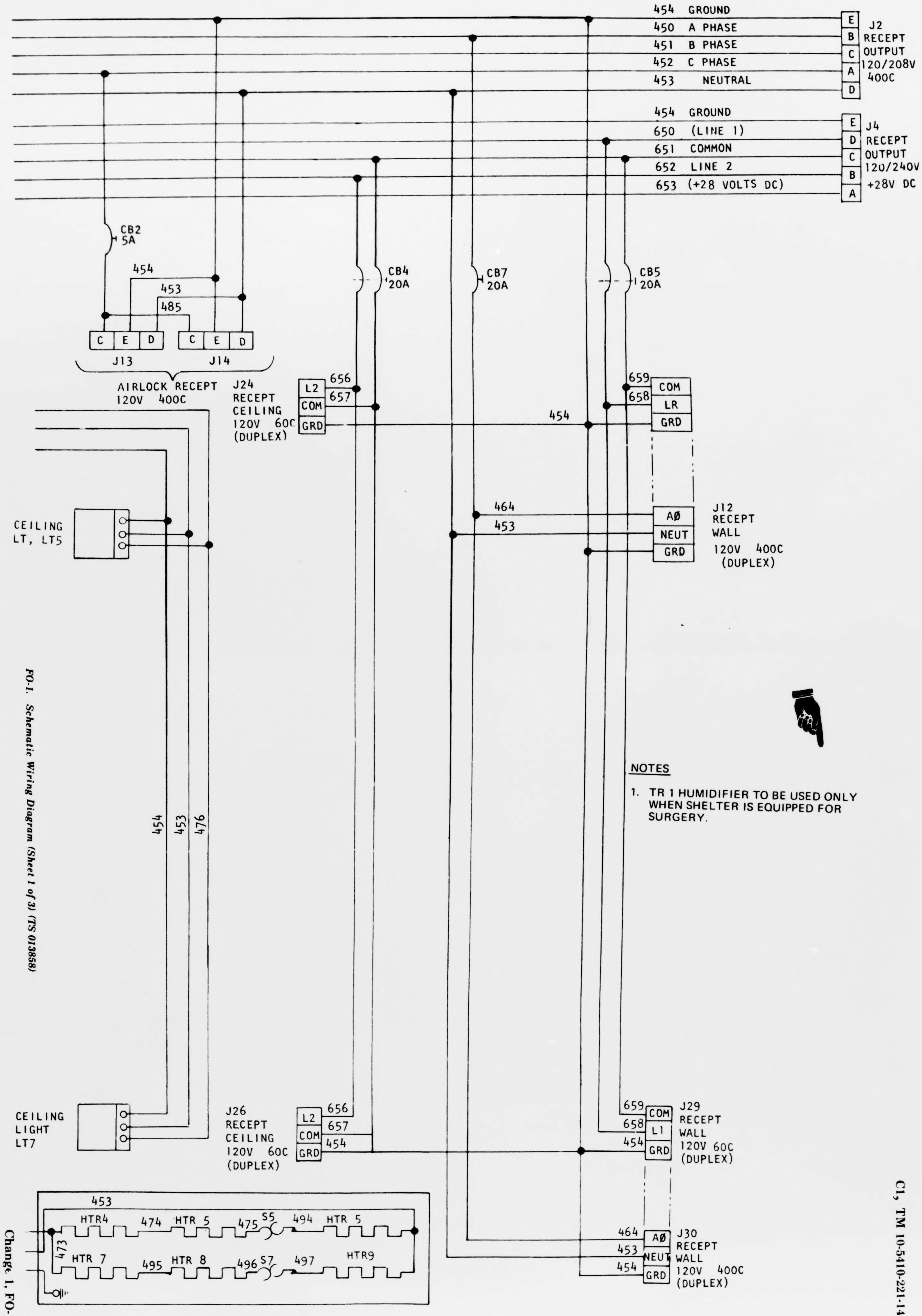
1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	centimeters	inches	394
feet	meters	.305	meters	feet	3.280
yards	meters	.914	meters	yards	1.094
miles	kilometers	1.609	kilometers	miles	.621
square inches	square centimeters	6.451	square centimeters	square inches	.155
square feet	square meters	.093	square meters	square feet	10.764
square yards	square meters	.836	square meters	square yards	1.196
square miles	square kilometers	2.590	square kilometers	square miles	.386
acres	square hectometers	.405	square hectometers	acres	2.471
cubic feet	cubic meters	.028	cubic meters	cubic feet	35.315
cubic yards	cubic meters	.765	cubic meters	cubic yards	1.308
fluid ounces	milliliters	29.573	milliliters	fluid ounces	.034
pints	liters	.473	liters	pints	2.113
quarts	liters	.946	liters	quarts	1.057
gallons	liters	3.785	liters	gallons	.264
ounces	grams	28.349	grams	ounces	.035
pounds	kilograms	.454	kilograms	pounds	2.205
short tons	metric tons	.907	metric tons	short tons	1.102

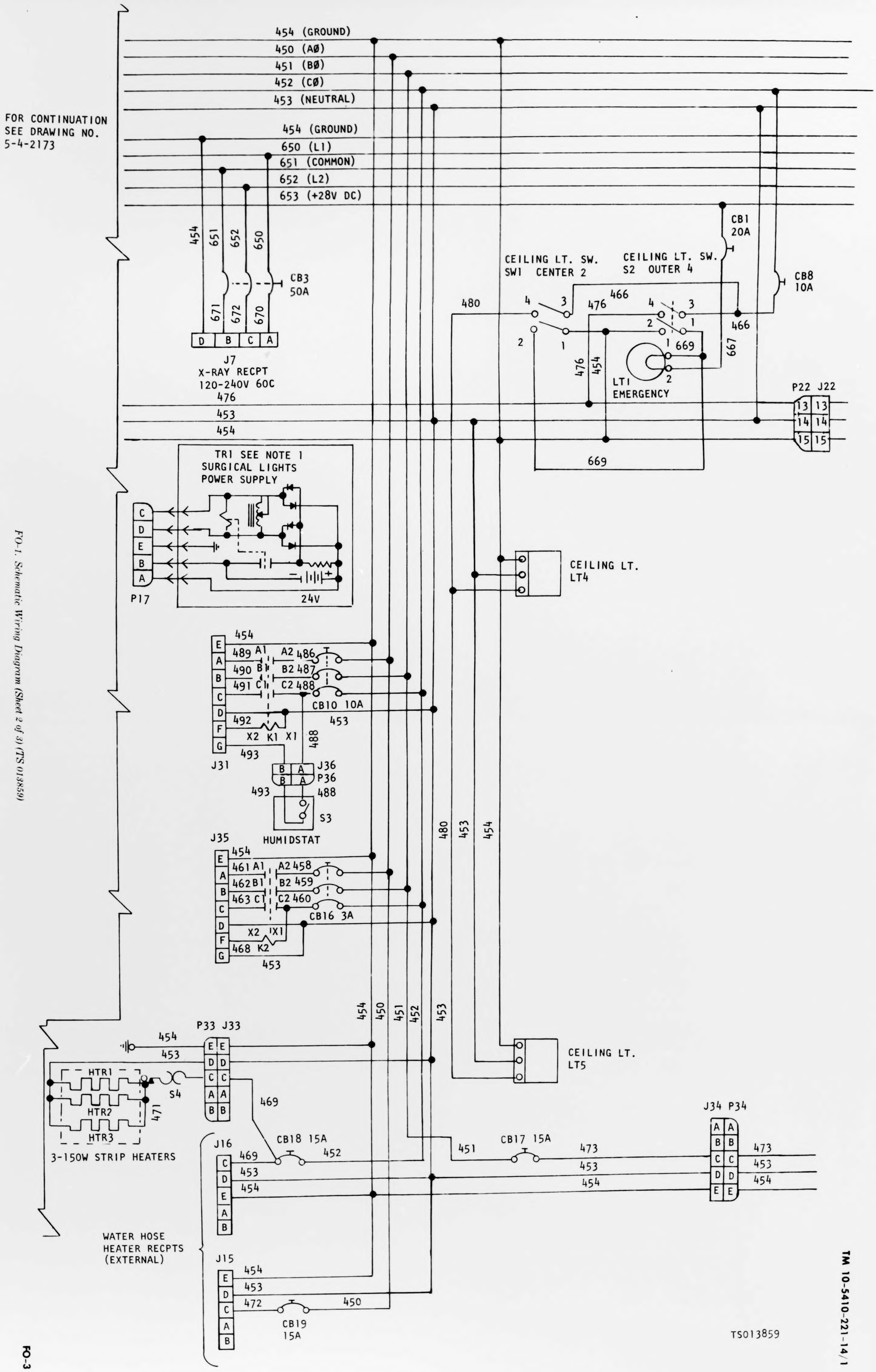

454 GROUND
450 A PHASE
451 B PHASE
452 C PHASE
453 NEUTRAL
E
B
C
A
D
J2
RECEPT
OUTPUT
120/208V
400C
454 GROUND
650 (LINE 1)
651 COMMON
652 LINE 2
653 (+28 VOLTS DC)
E
D
C
B
A
J4
RECEPT
OUTPUT
120/240V
+28V DC
CB2
5A
454
453
485
C
E
D
C
E
D
J13
J14
AIRLOCK RECEPT
120V 400C
CB4
20A
CB7
20A
CB5
20A
J24
RECEPT
CEILING
120V 60C
(DUPLEX)
L2
COM
GRD
656
657
454
659
658
COM
LR
GRD
464
453
AØ
NEUT
GRD
J12
RECEPT
WALL
120V 400C
(DUPLEX)
CEILING
LT, LT5
454
453
476
CEILING
LIGHT
LT7
J26
RECEPT
CEILING
120V 60C
(DUPLEX)
L2
COM
GRD
656
657
454
659
658
454
COM
L1
GRD
J29
RECEPT
WALL
120V 60C
(DUPLEX)
453
HTR4
474
HTR 5
475
S5
494
HTR 5
473
HTR 7
495
HTR 8
496
S7
497
HTR9
464
453
454
AØ
NEUT
GRD
J30
RECEPT
WALL
120V 400C
(DUPLEX)

NOTES

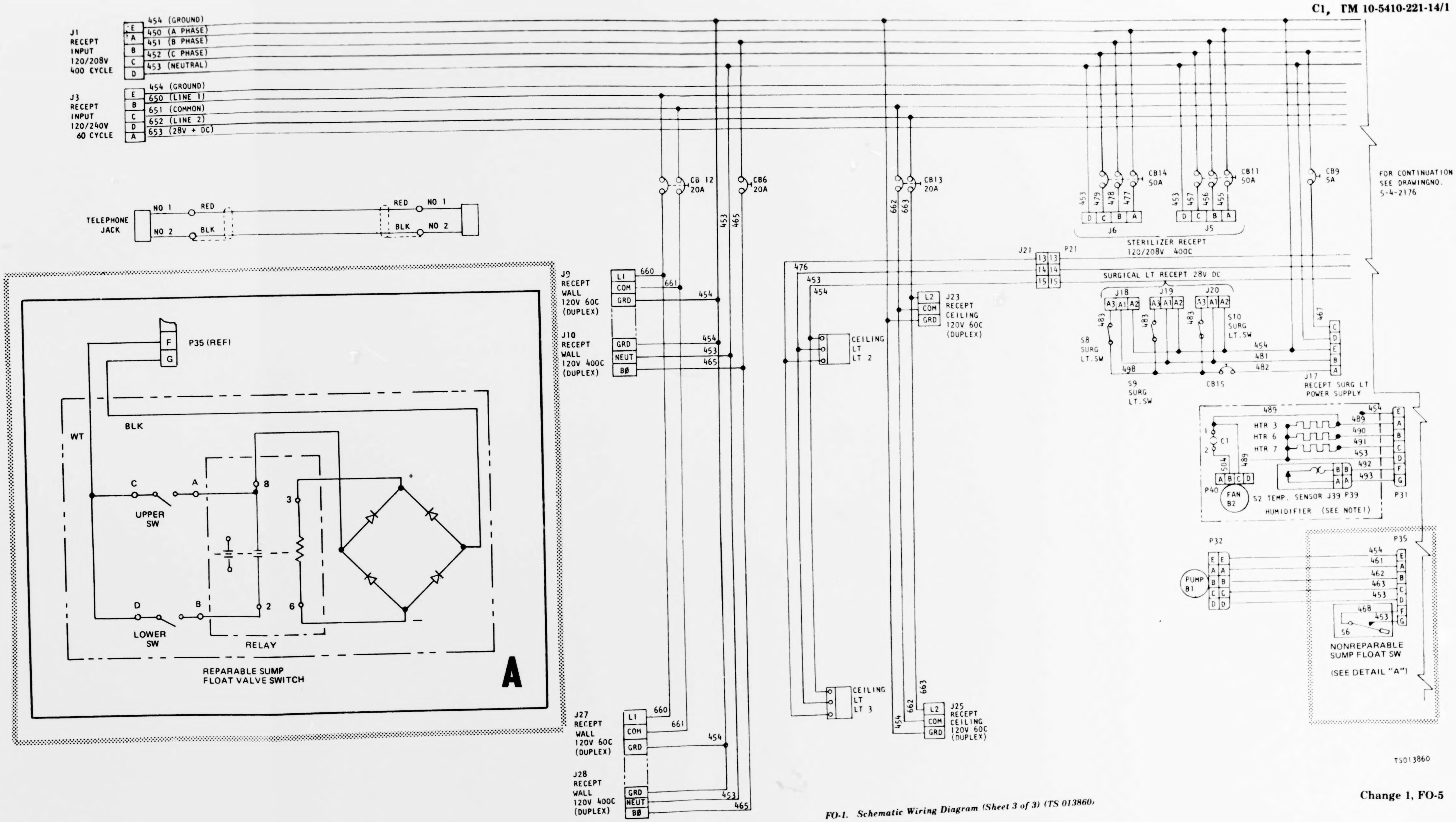
1. TR 1 HUMIDIFIER TO BE USED ONLY WHEN SHELTER IS EQUIPPED FOR SURGERY.

TS013858

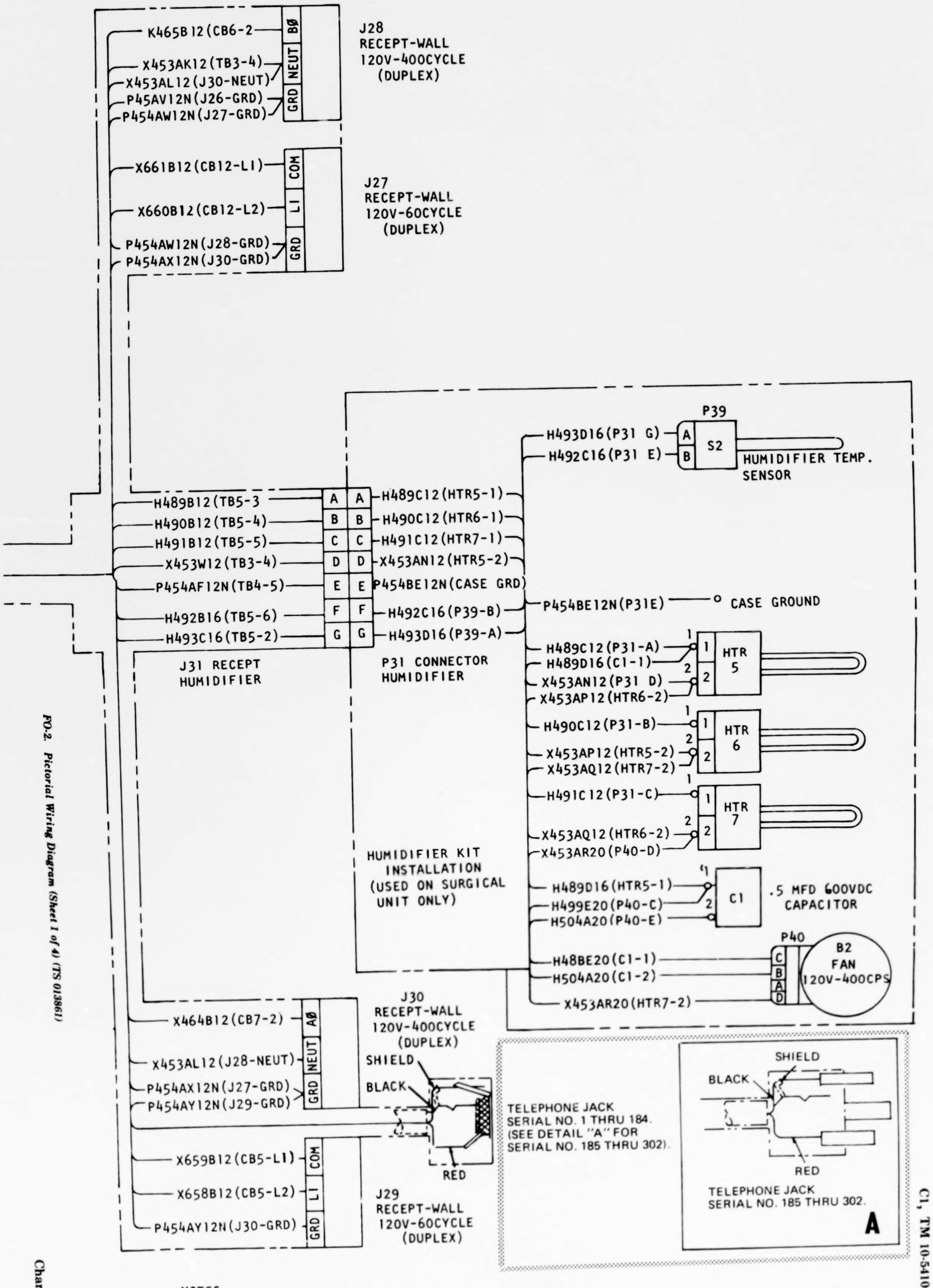
FO-1. Schematic Wiring Diagram (Sheet 1 of 3) (TS 013858)


FOR CONTINUATION SEE DRAWING NO. 5-4-2173
454 (GROUND)
450 (AØ)
451 (BØ)
452 (CØ)
453 (NEUTRAL)
454 (GROUND)
650 (L1)
651 (COMMON)
652 (L2)
653 (+28V DC)
454
651
652
650
CB3 50A
671
672
670
D B C A
J7
X-RAY RECPT
120-240V 60C
CB1 20A
CEILING LT. SW. SW1 CENTER 2
CEILING LT. SW. S2 OUTER 4
CB8 10A
480
4 3
466
476
4 3
2 1
2 1
466
667
669
476
454
LT1 EMERGENCY
P22 J22
13 13
14 14
15 15
476
453
454
669
TR1 SEE NOTE 1
SURGICAL LIGHTS
POWER SUPPLY
C D E B A
P17
24V
CEILING LT. LT4
454
E A B C D F G
489 A1 A2 486
490 B1 B2 487
491 C1 C2 488
CB10 10A
453
492
X2 K1 X1
488
J31
493
B A J36
B A P36
493 488
S3
HUMIDSTAT
J35
454
461 A1 A2 458
462 B1 B2 459
463 C1 C2 460
CB16 3A
X2 X1
468 K2
453
480
453
454
454
450
451
452
453
P33 J33
454
453
E E
D D
C C
A A
B B
HTR1
HTR2
HTR3
S4
471
469
3-150W STRIP HEATERS
CEILING LT. LT5
J16
469
CB18 15A
452
453
454
C D E A B
451
CB17 15A
473
453
454
J34 P34
A A
B B
C C
D D
E E
473
453
454
WATER HOSE HEATER RECPTS (EXTERNAL)
J15
454
453
472
450
CB19 15A
E D C A B
TS013859

FO-1. Schematic Wiring Diagram (Sheet 2 of 3) (TS 013859)


J1
RECEPT
INPUT
120/208V
400 CYCLE
454 (GROUND)
450 (A PHASE)
451 (B PHASE)
452 (C PHASE)
453 (NEUTRAL)
J3
RECEPT
INPUT
120/240V
60 CYCLE
454 (GROUND)
650 (LINE 1)
651 (COMMON)
652 (LINE 2)
653 (28V + DC)
TELEPHONE
JACK
NO 1
NO 2
RED
BLK
CB 12
20A
CB6
20A
CB13
20A
CB14
50A
CB11
50A
CB9
5A
J6
J5
STERILIZER RECEPT
120/208V 400C
FOR CONTINUATION
SEE DRAWINGNO.
5-4-2176
J9
RECEPT
WALL
120V 60C
(DUPLEX)
J10
RECEPT
WALL
120V 400C
(DUPLEX)
J27
RECEPT
WALL
120V 60C
(DUPLEX)
J28
RECEPT
WALL
120V 400C
(DUPLEX)
L1
COM
GRD
NEUT
BØ
J21
P21
SURGICAL LT RECEPT 28V DC
J18
J19
J20
S8
SURG
LT.SW
S9
SURG
LT.SW
S10
SURG
LT.SW
CB15
J17
RECEPT SURG LT
POWER SUPPLY
J23
RECEPT
CEILING
120V 60C
(DUPLEX)
J25
RECEPT
CEILING
120V 60C
(DUPLEX)
CEILING
LT
LT 2
CEILING
LT
LT 3
HTR 3
HTR 6
HTR 7
C1
FAN
B2
P40
S2 TEMP. SENSOR J39 P39
HUMIDIFIER (SEE NOTE1)
P31
P32
PUMP
B1
P35
S6
NONREPARABLE
SUMP FLOAT SW
(SEE DETAIL "A")
P35 (REF)
WT
BLK
UPPER
SW
LOWER
SW
RELAY
REPARABLE SUMP
FLOAT VALVE SWITCH
A
TS013860

FO-1. *Schematic Wiring Diagram (Sheet 3 of 3) (TS 013860)*

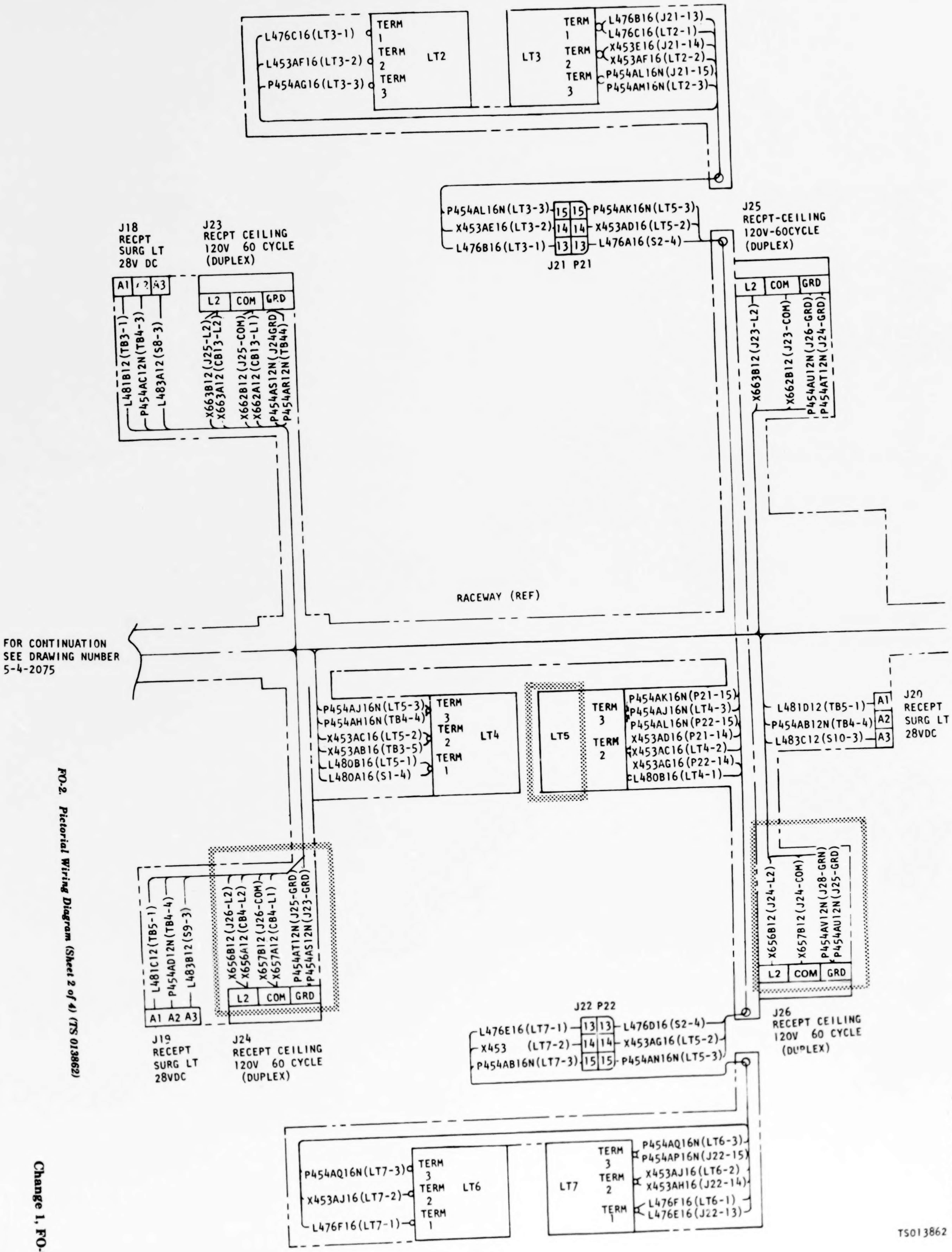

K465B12(CB6-2
BØ
X453AK12(TB3-4)
X453AL12(J30-NEUT)
NEUT
P45AV12N(J26-GRD)
P454AW12N(J27-GRD)
GRD
J28
RECEPT-WALL
120V-400CYCLE
(DUPLEX)
X661B12(CB12-L1)
COM
X660B12(CB12-L2)
L1
P454AW12N(J28-GRD)
P454AX12N(J30-GRD)
GRD
J27
RECEPT-WALL
120V-60CYCLE
(DUPLEX)
P39
H493D16(P31 G)
H492C16(P31 E)
A
B
S2
HUMIDIFIER TEMP.
SENSOR
H489B12(TB5-3
H490B12(TB5-4)
H491B12(TB5-5)
X453W12(TB3-4)
P454AF12N(TB4-5)
H492B16(TB5-6)
H493C16(TB5-2)
A
B
C
D
E
F
G
H489C12(HTR5-1)
H490C12(HTR6-1)
H491C12(HTR7-1)
X453AN12(HTR5-2)
P454BE12N(CASE GRD)
H492C16(P39-B)
H493D16(P39-A)
P454BE12N(P31E)
CASE GROUND
J31 RECEPT
HUMIDIFIER
P31 CONNECTOR
HUMIDIFIER
H489C12(P31-A)
H489D16(C1-1)
X453AN12(P31 D)
X453AP12(HTR6-2)
1
2
HTR
5
H490C12(P31-B)
X453AP12(HTR5-2)
X453AQ12(HTR7-2)
HTR
6
H491C12(P31-C)
X453AQ12(HTR6-2)
X453AR20(P40-D)
HTR
7
HUMIDIFIER KIT
INSTALLATION
(USED ON SURGICAL
UNIT ONLY)
H489D16(HTR5-1)
H499E20(P40-C)
H504A20(P40-E)
C1
.5 MFD 600VDC
CAPACITOR
P40
H48BE20(C1-1)
H504A20(C1-2)
X453AR20(HTR7-2)
C
B
A
D
B2
FAN
120V-400CPS
X464B12(CB7-2)
AØ
X453AL12(J28-NEUT)
NEUT
P454AX12N(J27-GRD)
P454AY12N(J29-GRD)
GRD
J30
RECEPT-WALL
120V-400CYCLE
(DUPLEX)
SHIELD
BLACK
RED
X659B12(CB5-L1)
COM
X658B12(CB5-L2)
L1
P454AY12N(J30-GRD)
GRD
J29
RECEPT-WALL
120V-60CYCLE
(DUPLEX)
TELEPHONE JACK
SERIAL NO. 1 THRU 184.
(SEE DETAIL "A" FOR
SERIAL NO. 185 THRU 302).
SHIELD
BLACK
RED
TELEPHONE JACK
SERIAL NO. 185 THRU 302.
A

FO-2. Pictorial Wiring Diagram (Sheet 1 of 4) (TS 013861)

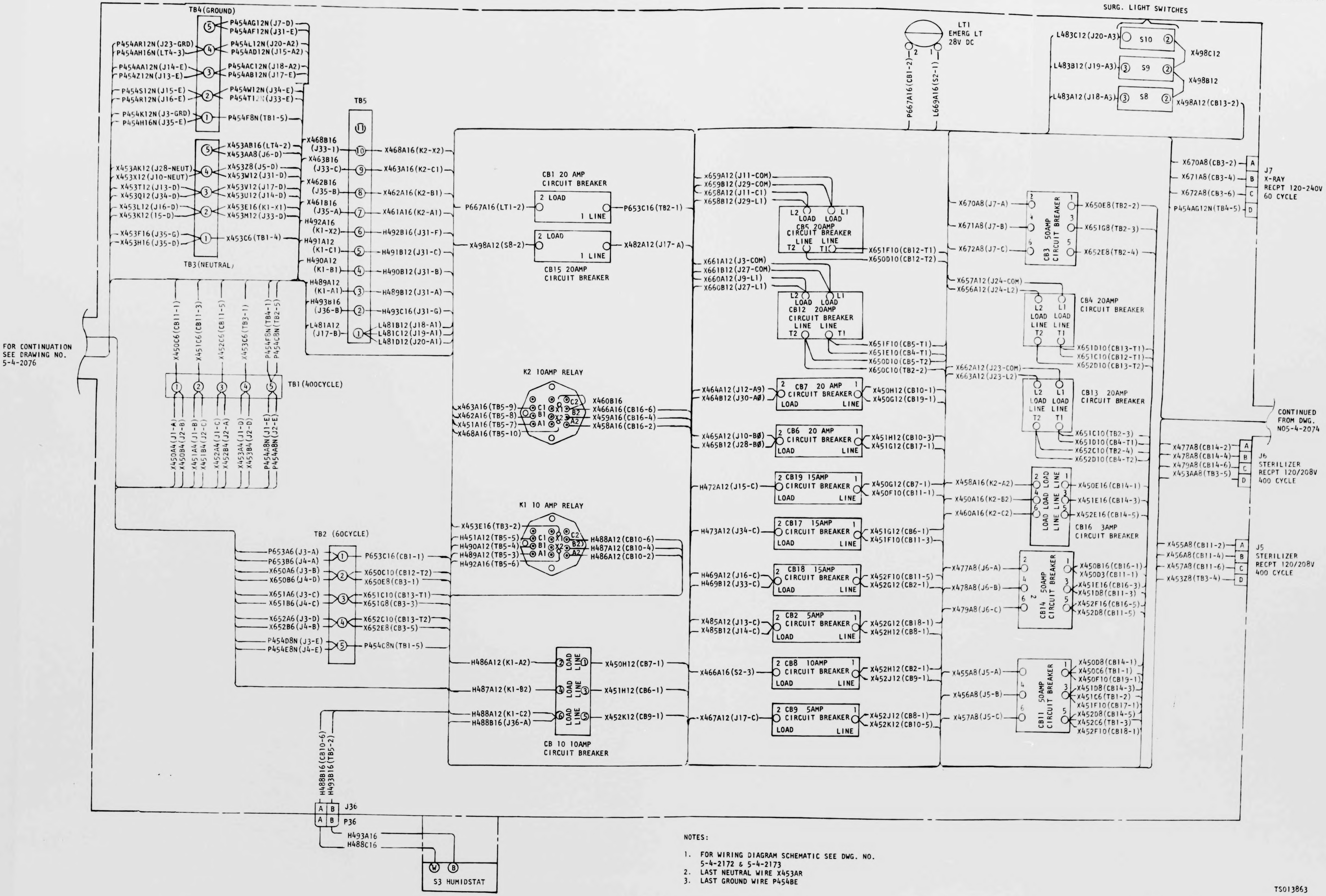
NOTES:

1. FOR WIRING DIAGRAM SCHEMATIC SEE DWG 5-4-2172 & 5-4-2173
2. LAST NEUTRAL WIRE X453AR
3. LAST GROUND WIRE P454BE

TS013861


L476C16(LT3-1)
L453AF16(LT3-2)
P454AG16(LT3-3)
TERM 1
TERM 2
TERM 3
LT2
LT3
L476B16(J21-13)
L476C16(LT2-1)
X453E16(J21-14)
X453AF16(LT2-2)
P454AL16N(J21-15)
P454AM16N(LT2-3)
P454AL16N(LT3-3)
X453AE16(LT3-2)
L476B16(LT3-1)
15 15
14 14
13 13
J21 P21
P454AK16N(LT5-3)
X453AD16(LT5-2)
L476A16(S2-4)
J25
RECPT-CEILING
120V-60CYCLE
(DUPLEX)
L2 COM GRD
X663B12(J23-L2)
X662B12(J23-COM)
P454AU12N(J26-GRD)
P454AT12N(J24-GRD)
J18
RECPT
SURG LT
28V DC
A1 A2 A3
L481B12(TB3-1)
P454AC12N(TB4-3)
L483A12(S8-3)
J23
RECPT CEILING
120V 60 CYCLE
(DUPLEX)
L2 COM GRD
X663B12(J25-L2)
X663A12(CB13-L2)
X662B12(J25-COM)
X662A12(CB13-L1)
P454AS12N(J24GRD)
P454AR12N(TB44)
RACEWAY (REF)
FOR CONTINUATION
SEE DRAWING NUMBER
5-4-2075
P454AJ16N(LT5-3)
P454AH16N(TB4-4)
X453AC16(LT5-2)
X453AB16(TB3-5)
L480B16(LT5-1)
L480A16(S1-4)
TERM 3
TERM 2
TERM 1
LT4
LT5
TERM 3
TERM 2
P454AK16N(P21-15)
P454AJ16N(LT4-3)
P454AL16N(P22-15)
X453AD16(P21-14)
X453AC16(LT4-2)
X453AG16(P22-14)
L480B16(LT4-1)
L481D12(TB5-1)
P454AB12N(TB4-4)
L483C12(S10-3)
A1 A2 A3
J20
RECEPT
SURG LT
28VDC
L481C12(TB5-1)
P454AD12N(TB4-4)
L483B12(S9-3)
A1 A2 A3
J19
RECEPT
SURG LT
28VDC
X656B12(J26-L2)
X656A12(CB4-L2)
X657B12(J26-COM)
X657A12(CB4-L1)
P454AT12N(J25-GRD)
P454AS12N(J23-GRD)
L2 COM GRD
J24
RECEPT CEILING
120V 60 CYCLE
(DUPLEX)
X656B12(J24-L2)
X657B12(J24-COM)
P454AV12N(J28-GRN)
P454AU12N(J25-GRD)
L2 COM GRD
J26
RECEPT CEILING
120V 60 CYCLE
(DUPLEX)
J22 P22
L476E16(LT7-1)
X453 (LT7-2)
P454AB16N(LT7-3)
13 13
14 14
15 15
L476D16(S2-4)
X453AG16(LT5-2)
P454AN16N(LT5-3)
P454AQ16N(LT7-3)
X453AJ16(LT7-2)
L476F16(LT7-1)
TERM 3
TERM 2
TERM 1
LT6
LT7
TERM 3
TERM 2
TERM 1
P454AQ16N(LT6-3)
P454AP16N(J22-15)
X453AJ16(LT6-2)
X453AH16(J22-14)
L476F16(LT6-1)
L476E16(J22-13)
TS013862

FO-2. Pictorial Wiring Diagram (Sheet 2 of 4) (TS 013862)

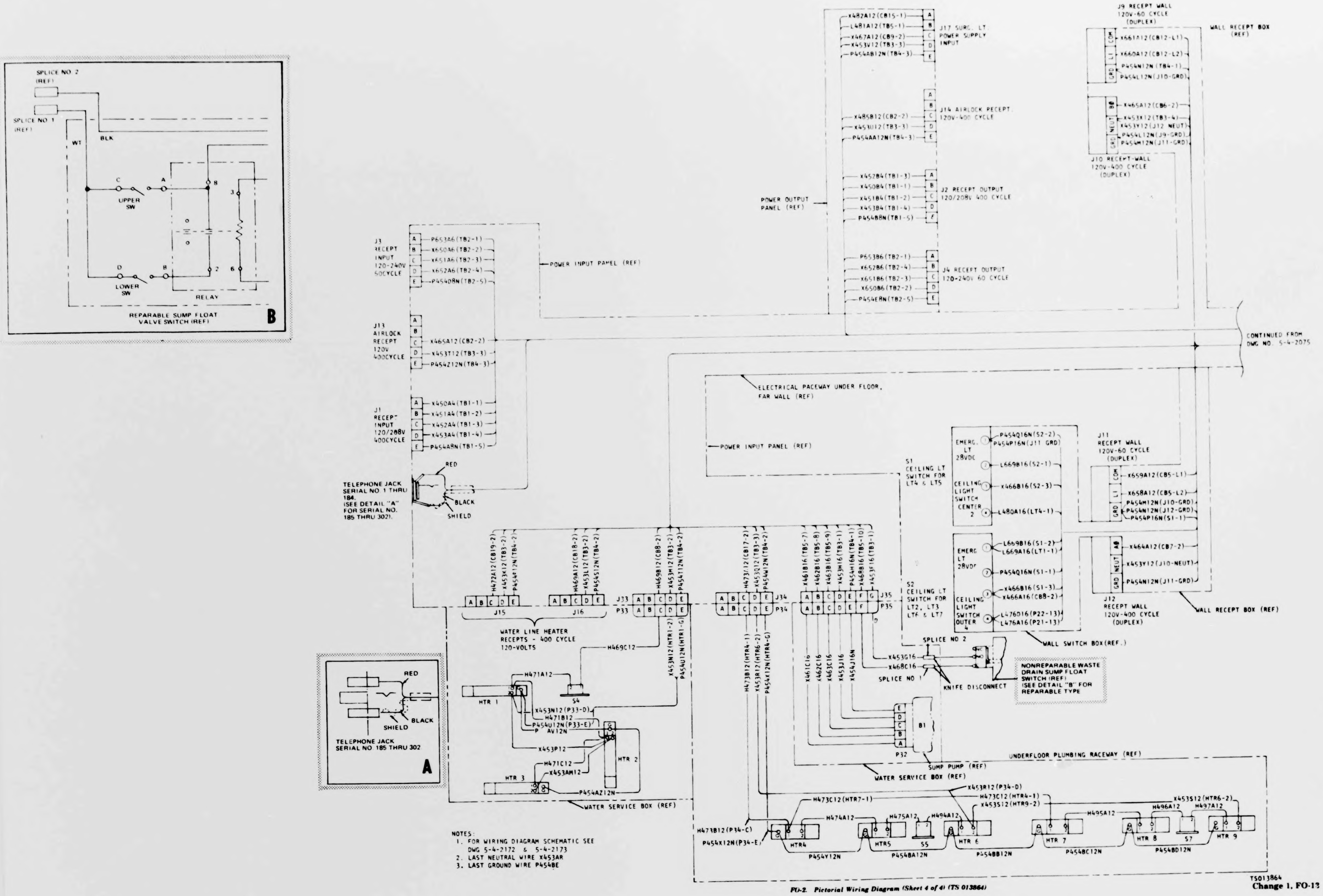

TB4 (GROUND)
P454AG12N (J7-D)
P454AF12N (J31-E)
P454AR12N (J23-GRD)
P454AH16N (LT4-3)
P454L12N (J20-A2)
P454AD12N (J15-A2)
P454AA12N (J14-E)
P454Z12N (J13-E)
P454AC12N (J18-A2)
P454AB12N (J17-E)
P454S12N (J15-E)
P454R12N (J16-E)
P454W12N (J34-E)
P454T12N (J33-E)
P454K12N (J3-GRD)
P454H16N (J35-E)
P454F8N (TB1-5)
X453AB16 (LT4-2)
X453AA8 (J6-D)
X453AK12 (J28-NEUT)
X453X12 (J10-NEUT)
X453Z8 (J5-D)
X453W12 (J31-D)
X453T12 (J13-D)
X453Q12 (J34-D)
X453V12 (J17-D)
X453U12 (J14-D)
X453L12 (J16-D)
X453K12 (15-D)
X453E16 (K1-X1)
X453M12 (J33-D)
X453F16 (J35-G)
X453H16 (J35-D)
X453C6 (TB1-4)
TB3 (NEUTRAL)
TB5
X468B16 (J33-1)
X463B16 (J33-C)
X462B16 (J35-B)
X461B16 (J35-A)
H492A16 (K1-X2)
H491A12 (K1-C1)
H490A12 (K1-B1)
H489A12 (K1-A1)
H493B16 (J36-B)
L481A12 (J17-B)
X468A16 (K2-X2)
X463A16 (K2-C1)
X462A16 (K2-B1)
X461A16 (K2-A1)
H492B16 (J31-F)
H491B12 (J31-C)
H490B12 (J31-B)
H489B12 (J31-A)
H493C16 (J31-G)
L481B12 (J18-A1)
L481C12 (J19-A1)
L481D12 (J20-A1)
X450C6 (CB11-1)
X451C6 (CB11-3)
X452C6 (CB11-5)
X453C6 (TB3-1)
P454F8N (TB4-1)
P454C8N (TB2-5)
FOR CONTINUATION SEE DRAWING NO. 5-4-2076
TB1 (400CYCLE)
X450A4 (J1-A)
X450B4 (J2-B)
X451A4 (J1-B)
X451B4 (J2-C)
X452A4 (J1-C)
X452B4 (J2-A)
X453A4 (J1-D)
X453B4 (J2-D)
P454A8N (J1-E)
P454A8N (J2-E)
TB2 (60CYCLE)
P653A6 (J3-A)
P653B6 (J4-A)
P653C16 (CB1-1)
X650A6 (J3-B)
X650B6 (J4-D)
X650C10 (CB12-T2)
X650E8 (CB3-1)
X651A6 (J3-C)
X651B6 (J4-C)
X651C10 (CB13-T1)
X651G8 (CB3-3)
X652A6 (J3-D)
X652B6 (J4-B)
X652C10 (CB13-T2)
X652E8 (CB3-5)
P454D8N (J3-E)
P454E8N (J4-E)
P454C8N (TB1-5)
J36
P36
H488B16 (CB10-6)
H493B16 (TB5-2)
H493A16
H488C16
W
B
S3 HUMIDSTAT
CB1 20 AMP CIRCUIT BREAKER
2 LOAD
1 LINE
P667A16 (LT1-2)
P653C16 (TB2-1)
X498A12 (S8-2)
X482A12 (J17-A)
CB15 20AMP CIRCUIT BREAKER
K2 10AMP RELAY
X463A16 (TB5-9)
X462A16 (TB5-8)
X451A16 (TB5-7)
X468A16 (TB5-10)
C1 B1 A1 X1 X2 C2 B2 A2
X460B16
X466A16 (CB16-3)
X459A16 (CB16-4)
X458A16 (CB16-2)
K1 10 AMP RELAY
X453E16 (TB3-2)
H451A12 (TB5-5)
H490A12 (TB5-4)
H489A12 (TB5-3)
H492A16 (TB5-6)
H488A12 (CB10-6)
H487A12 (CB10-4)
H486A12 (CB10-2)
H486A12 (K1-A2)
H487A12 (K1-B2)
H488A12 (K1-C2)
H488B16 (J36-A)
X450H12 (CB7-1)
X451H12 (CB6-1)
X452K12 (CB9-1)
CB 10 10AMP CIRCUIT BREAKER
LT1 EMERG LT 28V DC
P667A16 (CB1-2)
L669A16 (S2-1)
SURG. LIGHT SWITCHES
L483C12 (J20-A3)
S10
X498C12
L483B12 (J19-A3)
S9
X498B12
L483A12 (J18-A3)
S8
X498A12 (CB13-2)
X659A12 (J11-COM)
X659B12 (J29-COM)
X658A12 (J11-C1)
X658B12 (J29-L1)
CB5 20AMP CIRCUIT BREAKER
L2 L1 LOAD LOAD LINE LINE T2 T1
X651F10 (CB12-T1)
X650D10 (CB12-T2)
X661A12 (J3-COM)
X661B12 (J27-COM)
X660A12 (J9-L1)
X660B12 (J27-L1)
CB12 20AMP CIRCUIT BREAKER
X651F10 (CB5-T1)
X651E10 (CB4-T1)
X650D10 (CB5-T2)
X650C10 (TB2-2)
X464A12 (J12-A9)
X464B12 (J30-A0)
CB7 20 AMP CIRCUIT BREAKER
X450H12 (CB10-1)
X450G12 (CB19-1)
X465A12 (J10-B0)
X465B12 (J28-B0)
CB6 20 AMP CIRCUIT BREAKER
X451H12 (CB10-3)
X451G12 (CB17-1)
H472A12 (J15-C)
CB19 15AMP CIRCUIT BREAKER
X450G12 (CB7-1)
X450F10 (CB11-1)
H473A12 (J34-C)
CB17 15AMP CIRCUIT BREAKER
X451G12 (CB6-1)
X451F10 (CB11-3)
H469A12 (J16-C)
H469B12 (J33-C)
CB18 15AMP CIRCUIT BREAKER
X452F10 (CB11-5)
X452G12 (CB2-1)
X485A12 (J13-C)
X485B12 (J14-C)
CB2 5AMP CIRCUIT BREAKER
X452G12 (CB18-1)
X452H12 (CB8-1)
X466A16 (S2-3)
CB8 10AMP CIRCUIT BREAKER
X452H12 (CB2-1)
X452J12 (CB9-1)
X467A12 (J17-C)
CB9 5AMP CIRCUIT BREAKER
X452J12 (CB8-1)
X452K12 (CB10-5)
X670A8 (J7-A)
X671A8 (J7-B)
X672A8 (J7-C)
CB3 50AMP CIRCUIT BREAKER
X650E8 (TB2-2)
X651G8 (TB2-3)
X652E8 (TB2-4)
X657A12 (J24-COM)
X656A12 (J24-L2)
CB4 20AMP CIRCUIT BREAKER
X651D10 (CB13-T1)
X651C10 (CB12-T1)
X652D10 (CB13-T2)
X662A12 (J23-COM)
X663A12 (J23-L2)
CB13 20AMP CIRCUIT BREAKER
X651C10 (TB2-3)
X651D10 (CB4-T1)
X652C10 (TB2-4)
X652D10 (CB4-T2)
X458A16 (K2-A2)
X450A16 (K2-B2)
X460A16 (K2-C2)
CB16 3AMP CIRCUIT BREAKER
X450E16 (CB14-1)
X451E16 (CB14-3)
X452E16 (CB14-5)
X477A8 (J6-A)
X478A8 (J6-B)
X479A8 (J6-C)
CB14 50AMP CIRCUIT BREAKER
X450B16 (CB16-1)
X450D3 (CB11-1)
X451E16 (CB16-3)
X451D8 (CB11-3)
X452F16 (CB16-5)
X452D8 (CB11-5)
X455A8 (J5-A)
X456A8 (J5-B)
X457A8 (J5-C)
CB11 50AMP CIRCUIT BREAKER
X450D8 (CB14-1)
X450C6 (TB1-1)
X450F10 (CB19-1)
X451D8 (CB14-3)
X451C6 (TB1-2)
X451F10 (CB17-1)
X452D8 (CB14-5)
X452C6 (TB1-3)
X452F10 (CB18-1)
X670A8 (CB3-2)
X671A8 (CB3-4)
X672A8 (CB3-6)
P454AG12N (TB4-5)
J7 X-RAY RECPT 120-240V 60 CYCLE
CONTINUED FROM DWG. NO5-4-2074
X477A8 (CB14-2)
X478A8 (CB14-4)
X479A8 (CB14-6)
X453AA8 (TB3-5)
J6 STERILIZER RECPT 120/208V 400 CYCLE
X455A8 (CB11-2)
X456A8 (CB11-4)
X457A8 (CB11-6)
X453Z8 (TB3-4)
J5 STERILIZER RECPT 120/208V 400 CYCLE
A B C D

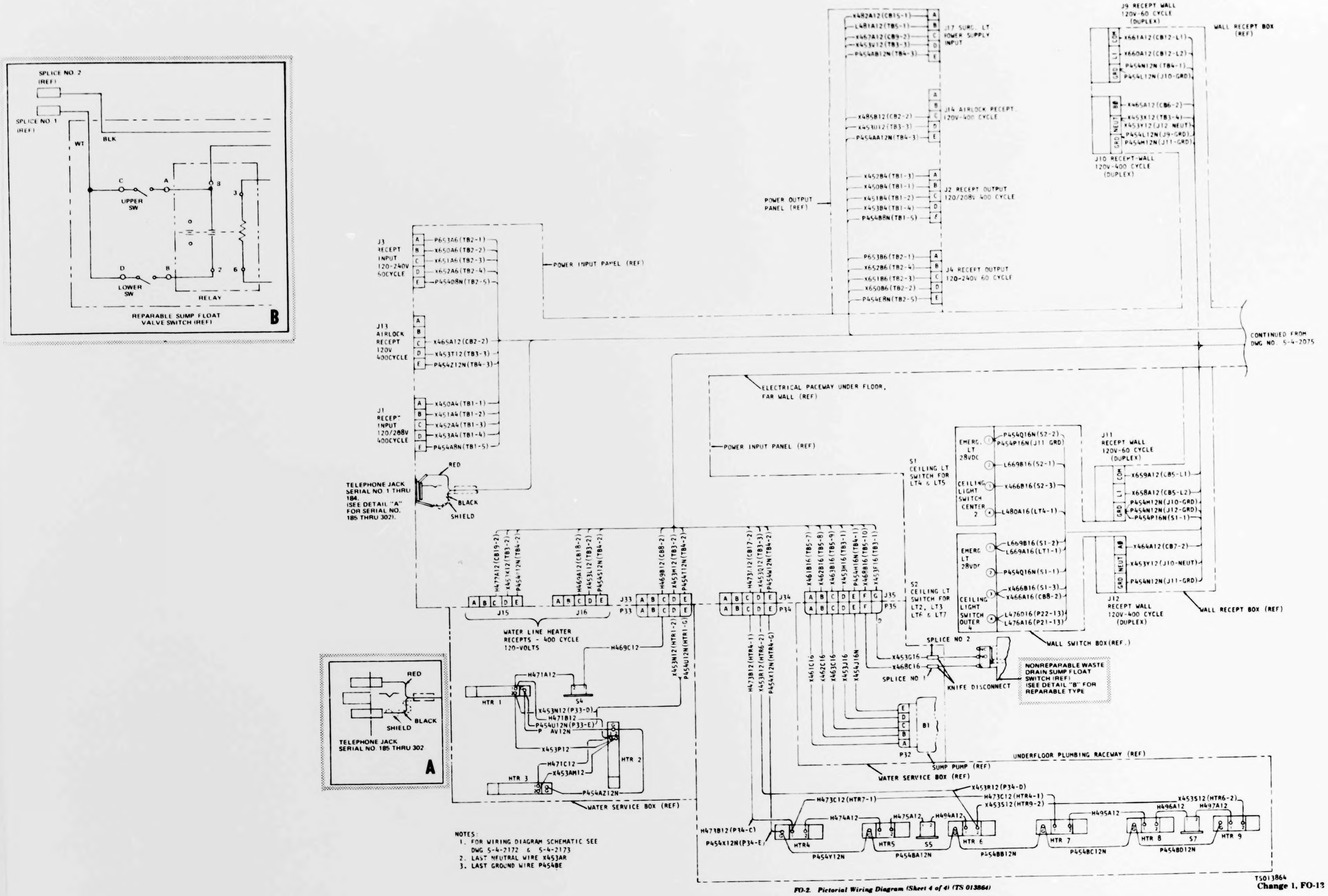
NOTES:

1. FOR WIRING DIAGRAM SCHEMATIC SEE DWG. NO. 5-4-2172 & 5-4-2173
2. LAST NEUTRAL WIRE X453AR
3. LAST GROUND WIRE P454BE

TS013863

FO-2. Pictorial Wiring Diagram (Sheet 3 of 4) (TS 013863)




SPLICE NO. 2
(REF)
SPLICE NO. 1
(REF)
WT
BLK
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A
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UPPER SW
D
B
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6
LOWER SW
RELAY
REPARABLE SUMP FLOAT VALVE SWITCH (REF)
B
J3 RECEPT INPUT 120-240V 60CYCLE
P653A6(TB2-1)
X650A6(TB2-2)
X651A6(TB2-3)
X652A6(TB2-4)
P454D8N(TB2-5)
POWER INPUT PANEL (REF)
J13 AIRLOCK RECEPT 120V 400CYCLE
X465A12(CB2-2)
X453T12(TB3-3)
P454Z12N(TB4-3)
J1 RECEPT INPUT 120/208V 400CYCLE
X450A4(TB1-1)
X451A4(TB1-2)
X452A4(TB1-3)
X453A4(TB1-4)
P454A8N(TB1-5)
RED
BLACK
SHIELD
TELEPHONE JACK SERIAL NO. 1 THRU 184. (SEE DETAIL "A" FOR SERIAL NO. 185 THRU 302).
X482A12(CB15-1)
L481A12(TB5-1)
X467A12(CB9-2)
X453V12(TB3-3)
P454AB12N(TB4-3)
J17 SURG. LT POWER SUPPLY INPUT
J14 AIRLOCK RECEPT. 120V-400 CYCLE
X485B12(CB2-2)
X453U12(TB3-3)
P454AA12N(TB4-3)
POWER OUTPUT PANEL (REF)
X452B4(TB1-3)
X450B4(TB1-1)
X451B4(TB1-2)
X453B4(TB1-4)
P454B8N(TB1-5)
J2 RECEPT OUTPUT 120/208V 400 CYCLE
P653B6(TB2-1)
X652B6(TB2-4)
X651B6(TB2-3)
X650B6(TB2-2)
P454E8N(TB2-5)
J4 RECEPT OUTPUT 120-240V 60 CYCLE
J9 RECEPT WALL 120V-60 CYCLE (DUPLEX)
WALL RECEPT BOX (REF)
COM
L1
GRD
X661A12(CB12-L1)
X660A12(CB12-L2)
P454N12N(TB4-1)
P454L12N(J10-GRD)
AØ
NEUT
X465A12(CB6-2)
X453X12(TB3-4)
X453Y12(J12 NEUT)
P454L12N(J9-GRD)
P454M12N(J11-GRD)
J10 RECEPT-WALL 120V-400 CYCLE (DUPLEX)
CONTINUED FROM DWG NO. 5-4-2075
ELECTRICAL PACEWAY UNDER FLOOR, FAR WALL (REF)
POWER INPUT PANEL (REF)
S1 CEILING LT SWITCH FOR LT4 & LT5
EMERG. LT 28VDC
P454Q16N(S2-2)
P454P16N(J11 GRD)
L669B16(S2-1)
CEILING LIGHT SWITCH CENTER 2
X466B16(S2-3)
L480A16(LT4-1)
J11 RECEPT WALL 120V-60 CYCLE (DUPLEX)
X659A12(CB5-L1)
X658A12(CB5-L2)
P454M12N(J10-GRD)
P454N12N(J12-GRD)
P454P16N(S1-1)
S2 CEILING LT SWITCH FOR LT2, LT3 LT6 & LT7
EMERG LT 28VDC
L669B16(S1-2)
L669A16(LT1-1)
P454Q16N(S1-1)
X466B16(S1-3)
X466A16(CB8-2)
CEILING LIGHT SWITCH OUTER 4
L476D16(P22-13)
L476A16(P21-13)
X464A12(CB7-2)
X453Y12(J10-NEUT)
P454N12N(J11-GRD)
J12 RECEPT WALL 120V-400 CYCLE (DUPLEX)
WALL RECEPT BOX (REF)
WALL SWITCH BOX (REF.)
H472A12(CB19-2)
X453K12(TB3-2)
P454R12N(TB4-2)
H469A12(CB18-2)
X453L12(TB3-2)
P454S12N(TB4-2)
H469B12(CB8-2)
X453M12(TB3-2)
P454T12N(TB4-2)
H473A12(CB17-2)
X453Q12(TB3-3)
P454W12N(TB4-2)
X461B16(TB5-7)
X462B16(TB5-8)
X463B16(TB5-9)
X453H16(TB3-1)
P454H16N(TB4-1)
X468B16(TB5-10)
X453F16(TB3-1)
J15
J16
J33
P33
J34
P34
J35
P35
WATER LINE HEATER RECEPTS - 400 CYCLE 120-VOLTS
H469C12
X453N12(HTR1-2)
P454U12N(HTR1-G)
H473B12(HTR4-1)
X453R12(HTR6-2)
P454X12N(HTR4-G)
X461C16
X462C16
X463C16
X453J16
X454J16N
SPLICE NO 2
X453G16
X468C16
SPLICE NO 1
KNIFE DISCONNECT
NONREPARABLE WASTE DRAIN SUMP FLOAT SWITCH (REF) (SEE DETAIL "B" FOR REPARABLE TYPE
B1
P32
SUMP PUMP (REF)
WATER SERVICE BOX (REF)
UNDERFLOOR PLUMBING RACEWAY (REF)
RED
BLACK
SHIELD
TELEPHONE JACK SERIAL NO. 185 THRU 302
A
H471A12
HTR 1
S4
X453N12(P33-D)
H471B12
P454U12N(P33-E)
P AV12N
X453P12
HTR 2
H471C12
X453AM12
HTR 3
P454AZ12N
WATER SERVICE BOX (REF)
X453R12(P34-D)
H473C12(HTR7-1)
H473C12(HTR4-1)
X453S12(HTR9-2)
X453S12(HTR6-2)
H473B12(P34-C)
P454X12N(P34-E)
H474A12
H475A12
H494A12
H495A12
H496A12
H497A12
HTR4
HTR5
S5
HTR 6
HTR 7
HTR 8
S7
HTR 9
P454Y12N
P454BA12N
P454BB12N
P454BC12N
P454BD12N
TS013864

NOTES:
1. FOR WIRING DIAGRAM SCHEMATIC SEE DWG 5-4-2172 & 5-4-2173
2. LAST NEUTRAL WIRE X453AR
3. LAST GROUND WIRE P454BE

FO-2. Pictorial Wiring Diagram (Sheet 4 of 4) (TS 013864)

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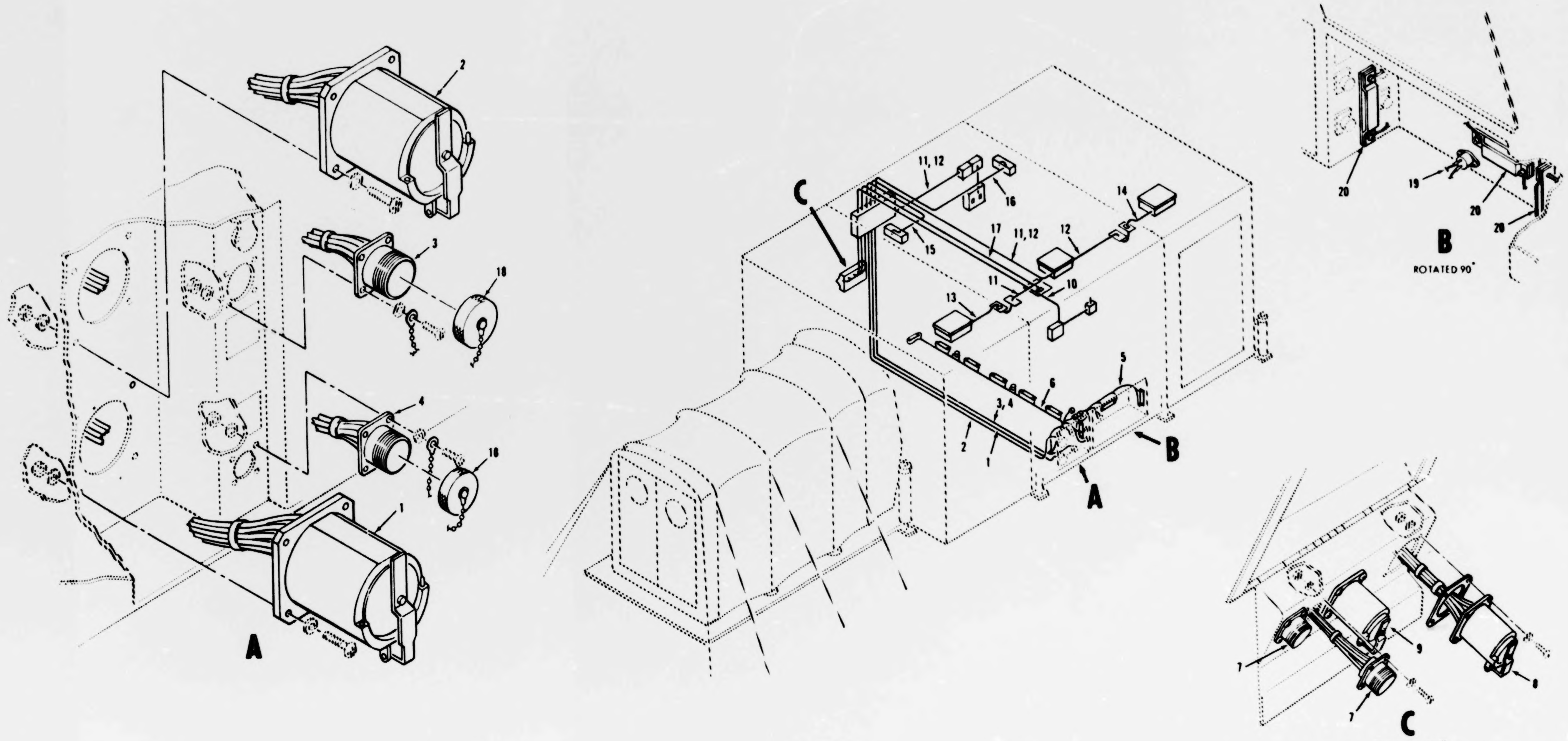

1. 60 Hz power in harness and connector assembly
2. 400 Hz power in harness and connector assembly
3. Heater and water box power harness assembly
* 4. Remote temperature sensor harness assembly
5. Water box heaters harness assembly
6. Water line heaters harness assembly
7. Surgical and air lock light harness and connector ay
8. 400 Hz power out harness and connector assembly
9. 60 Hz power out harness and connector assembly
10. Humidifier lights harness assembly
11. Fluorescent lights harness assembly (P21)
12. Fluorescent light harness assembly (P22)
13. Fluorescent light harness assembly (J21)
14. Fluorescent light harness assembly (J22)
15. Surgical lights harness assembly (J18)
16. Surgical lights harness assembly (J19)
17. Surgical lights harness assembly (J20)
18. Receptacle cover
19. Thermo switch
20. Water box heaters

NOTE

* Used on shelter serial No. 1 thru 184 only

FO-3. Shelter Harness Assemblies, Removal (TS 013865)

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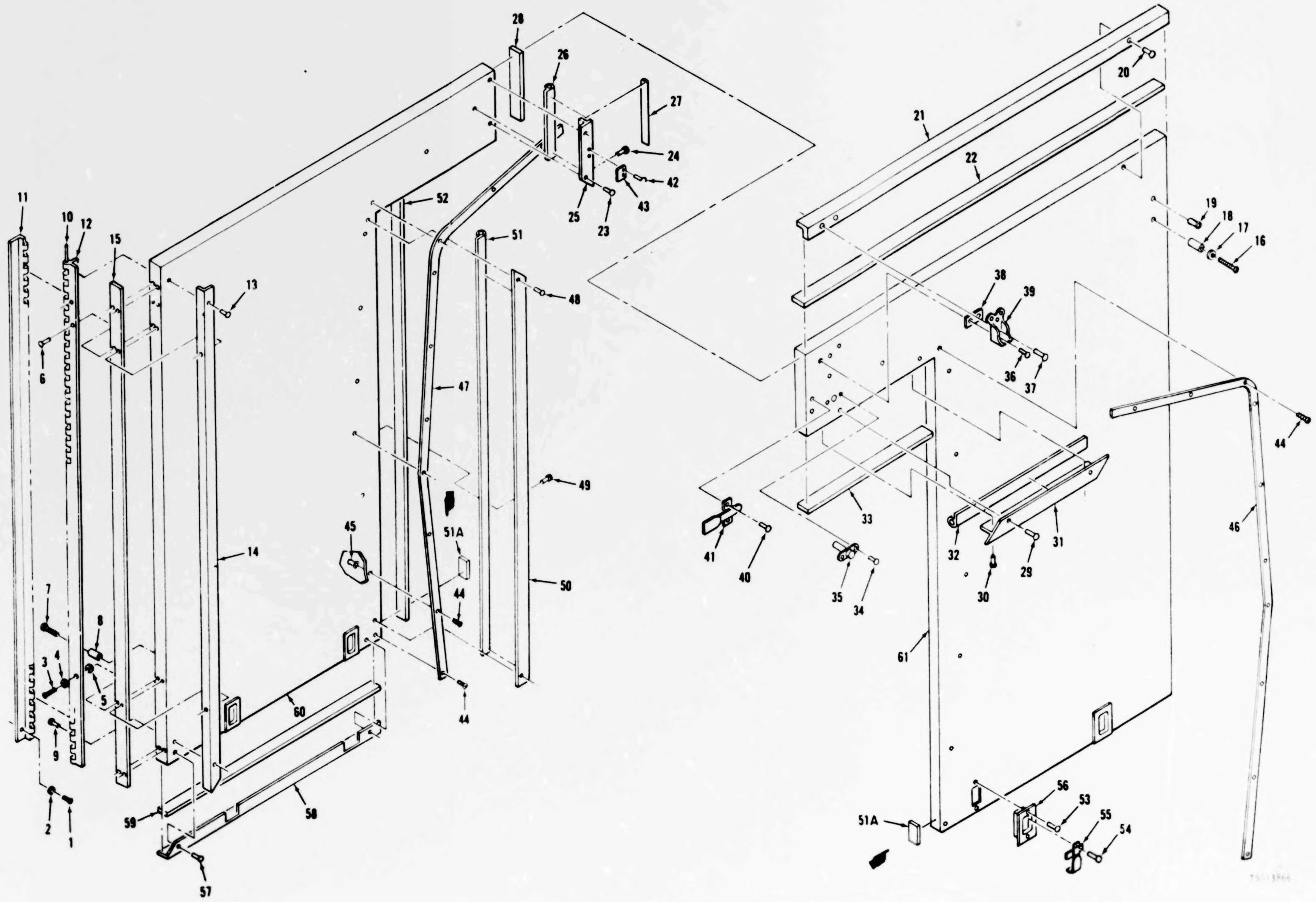
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TS 013866

1. Screw (36, 18 per hinge)
2. Washer (36, 18 per hinge)
3. Screw (8, 4 per hinge)
4. Washer (8, 4 per hinge)
5. Washer (8, 4 per hinge)
6. Rivet (48, 24 per hinge)
7. Screw (4, 2 per hinge)
8. Insert (4, 2 per panel)
9. Rivet (52, 26 per hinge)
10. Hinge pin (2)
11. Hinge half, end panel
12. Hinge half, side panel
13. Rivet (44, 22 per panel)
14. Angle
15. Closeout
16. Screw (4, 2 per panel)
17. Washer, (4, 2 per panel)
18. Ground rod (2, 1 per panel)
19. Rivnut (4, 2 per panel)
20. Rivet (16)
21. Angle
22. Closeout
23. Rivet (4)
24. Rivet (4)
25. Tee
26. Seal, bulb and tail
27. Seal, bulb
28. Closeout
29. Rivet (7)
30. Rivet (7)
31. Tee, R.H.
32. Seal, bulb and tail
33. Closeout (2)
34. Rivet (10)
35. Ball lock receptacle
36. Rivet (4, 2 per latch)
37. Rivet (2, 1 per latch)
38. Shim (2, 1 per latch)
39. Latch assembly (2)
40. Rivet (4)
41. Latch assembly
42. Rivet (8, 2 per plate)
43. Alinement plate (4)
44. Screw (10)
45. Rivnut
46. Adapter frame, R.H.
47. Adapter frame, L.H.
48. Rivet (38, 19 per panel)
49. Rivet (38, 19 per panel)
50. Tee
51. Seal, bulb and tail
*51A. Seal (2) ■
52. Closeout
53. Rivet (80, 10 per latch box)
54. Rivet (30, 10 per latch assembly)
55. Latch (10)
56. Latch box (10)
57. Rivet (24, 12 per panel)
58. Angle
59. Closeout
60. Side panel assembly, L.H.
61. Side panel assembly, R.H.

*Installed on shelter serial No. 402 and subsequent ■

FO-4. Side Panel Assembly, Disassembly (TS 013866)

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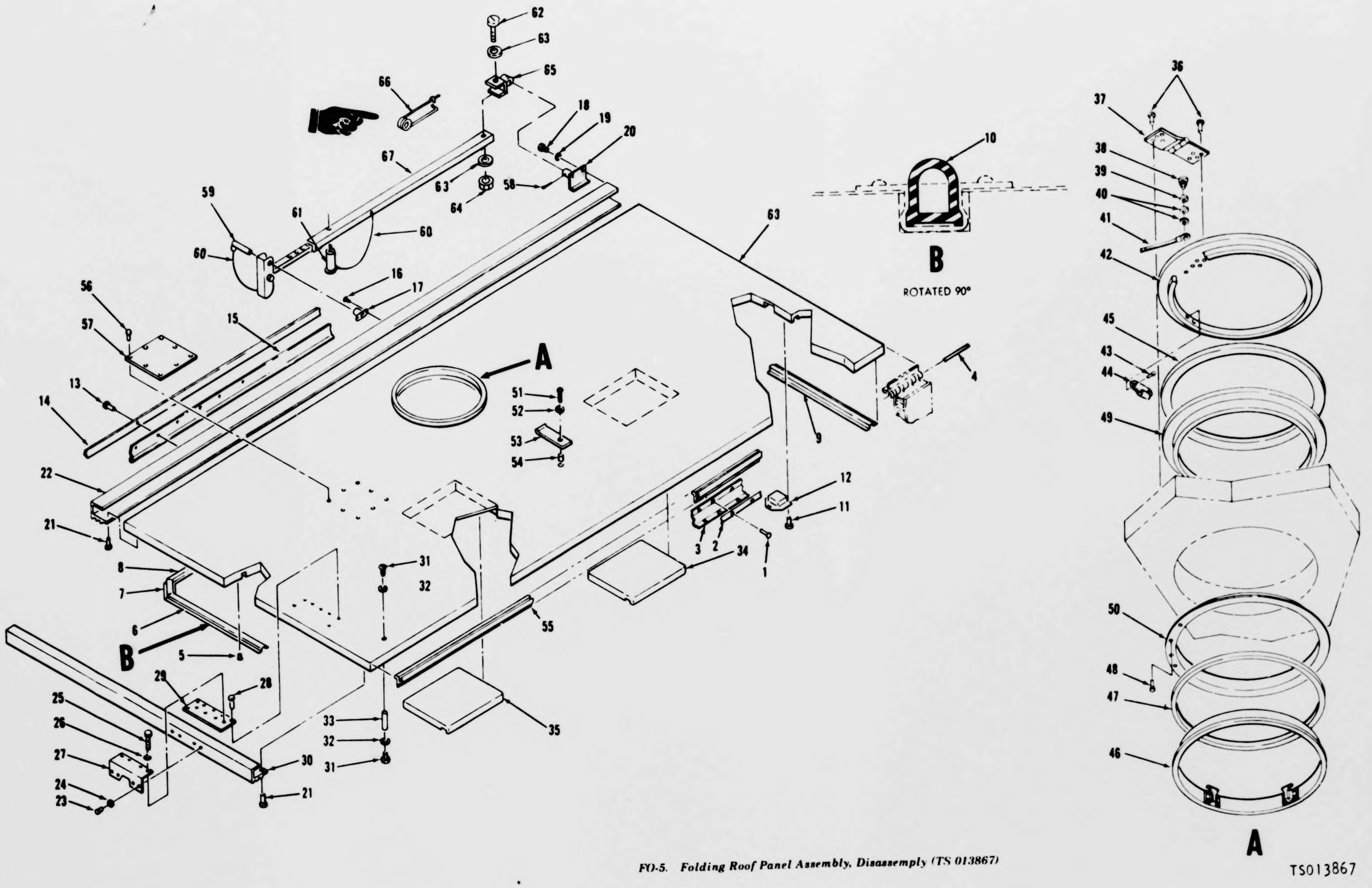
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TS013867

FO-5. Folding Roof Panel Assembly, Disassembly (TS 013867)

1. Rivet (184)
2. Retainer strip (2)
3. Seal
4. Hinge pin
5. Rivet (133)
6. Gasket retainer
7. Gasket retainer
8. Gasket retainer
9. Gasket retainer
10. Seal, bulb
11. Bolt
12. Strike assembly
13. Rivet (42)
14. Retainer strip
15. Seal
16. Rivet (4)
17. Receptacle, ball lock (2)
18. Bolt (4)
19. Washer (4)
20. Pivot assembly (2)
21. Rivet
22. Extrusion
23. Bolt (8)
24. Washer (8)
25. Bolt (8)
26. Washer (8)
27. Shear [illegible]le
28. Rive[illegible]
29. Spacer
30. Extrusion
31. Screw
32. Washer (2)
33. Ground rod
34. Box, fiberglass
35. Box, fiberglass
36. Rivet
37. Hinge assembly
38. Screw (2)
39. Washer (2)
40. Washer (4)
41. Strap
42. Duct cover
43. Rivets
44. Strike assembly
45. Duct cover seal
46. Flange
47. Gasket
48. Rivet
49. Angle, duct port
50. Angle, duct port
51. Screw
52. Washer
53. Clamp
54. Spacer
55. Seal
56. Rivet (16, 8 per scuff plate)
57. Scuff plate, mobilizer (2)

* 58. Pin (2)

* 59. Pin, ball lock (2)

60. Cable (2)
61. Pin, ball lock (2)
62. Bolt (2)
63. Washer (4)
64. Nut (2)
65. Pivot (2)

** 66. Safety pin (2)

67. Support assembly (2)
68. Folding roof panel

NOTE

* Installed on shelter serial No. 1 thru 184

** Installed on shelter serial No. 185 thru 302

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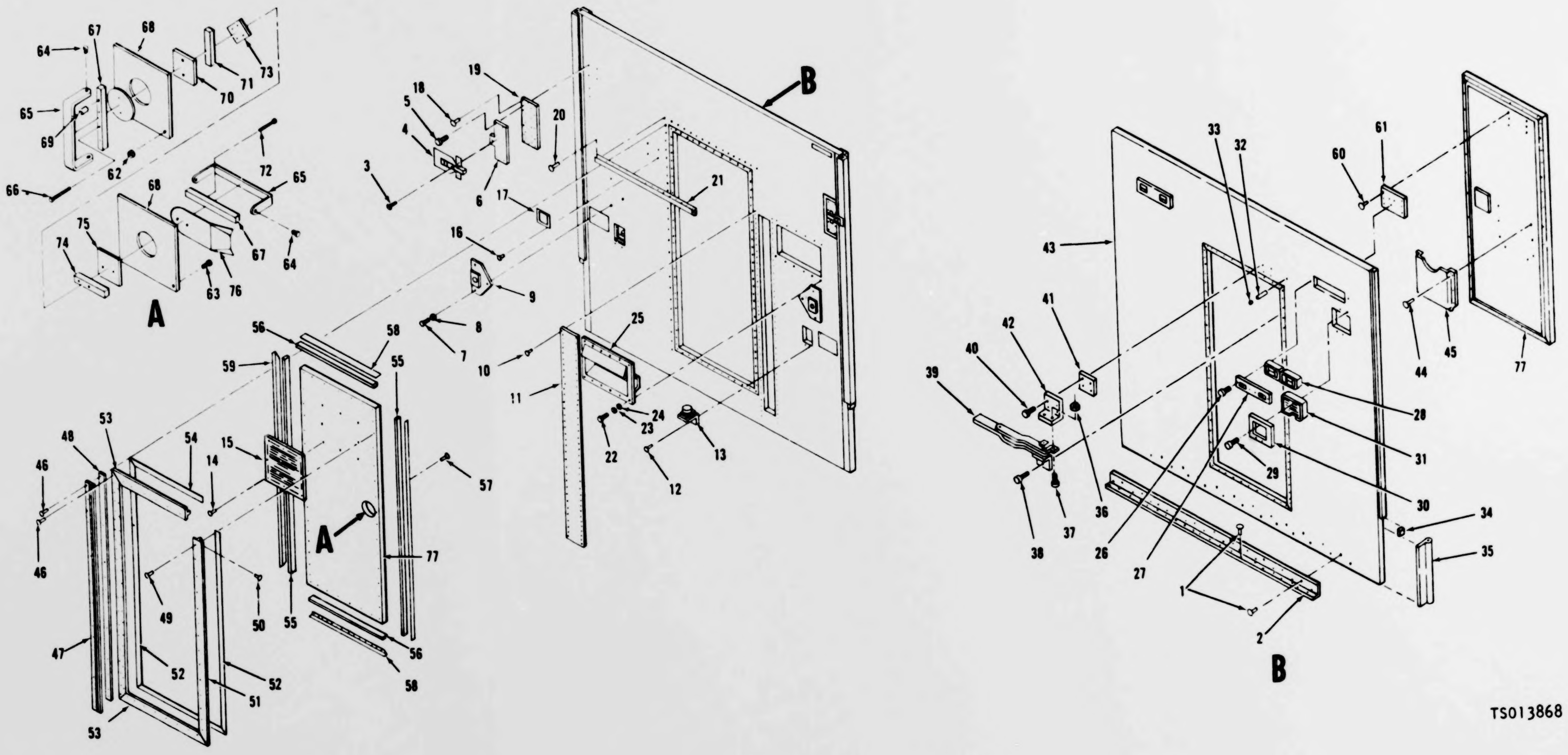
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FO-6. Fixed End Panel Assembly, Disassembly (TS 013868)

1. Rivet (44)
2. Angle
3. Screw (8)
4. Latch assembly (2)
5. Screw (20)
6. Shear plate
7. Bolt (6)
8. Washer (6)
9. Mobilizer bracket
10. Rivet (76)
11. Cover
12. Rivet (8. Level indicator (2)
14. Rivet (8)
15. Instruction plate
16. Rivet (4)
17. Identification plate
18. Rivet (22)
19. Plate, doubler (2)
20. Rivet (20)
21. Gutter
22. Screw (12)
23. Washer (12)
24. Washer (12)
25. Panel assembly
26. Screw
27. Cover (2)
28. Receptacle box
29. Screw
30. Cover
31. Switch box
32. Sterilizer vent
33. Cap
34. Seal
35. Seal
36. Nut (2)
37. Screw (2)
38. Screw (3)
39. Brace
40. Bolt (4)
41. Doubler
42. Angle
43. Fixed end panel assembly
44. Rivet (8)
45. Container
46. Rivet (22)
47. Hinge
48. Spacer
49. Rivet (54)
50. Rivet (54)
51. Tee (2)
52. Seal (2)
53. Tee (2)
54. Seal (2)
55. Closeout (2)
56. Closeout (2)
57. Rivet (54)
58. Angle (2)
59. Angle (2)
60. Rivet (6)
61. Doubler
62. Nut (4)
63. Screw (4)
64. Screw (4)
65. Handle, bar
66. Screw (2)
67. Handle, ball
68. Plate
69. Spacer
70. Keeper
71. Stop arm
72. Screw
73. Idler block
74. Stop arm
75. Keeper
76. Locking bladder
77. Access door panel assembly

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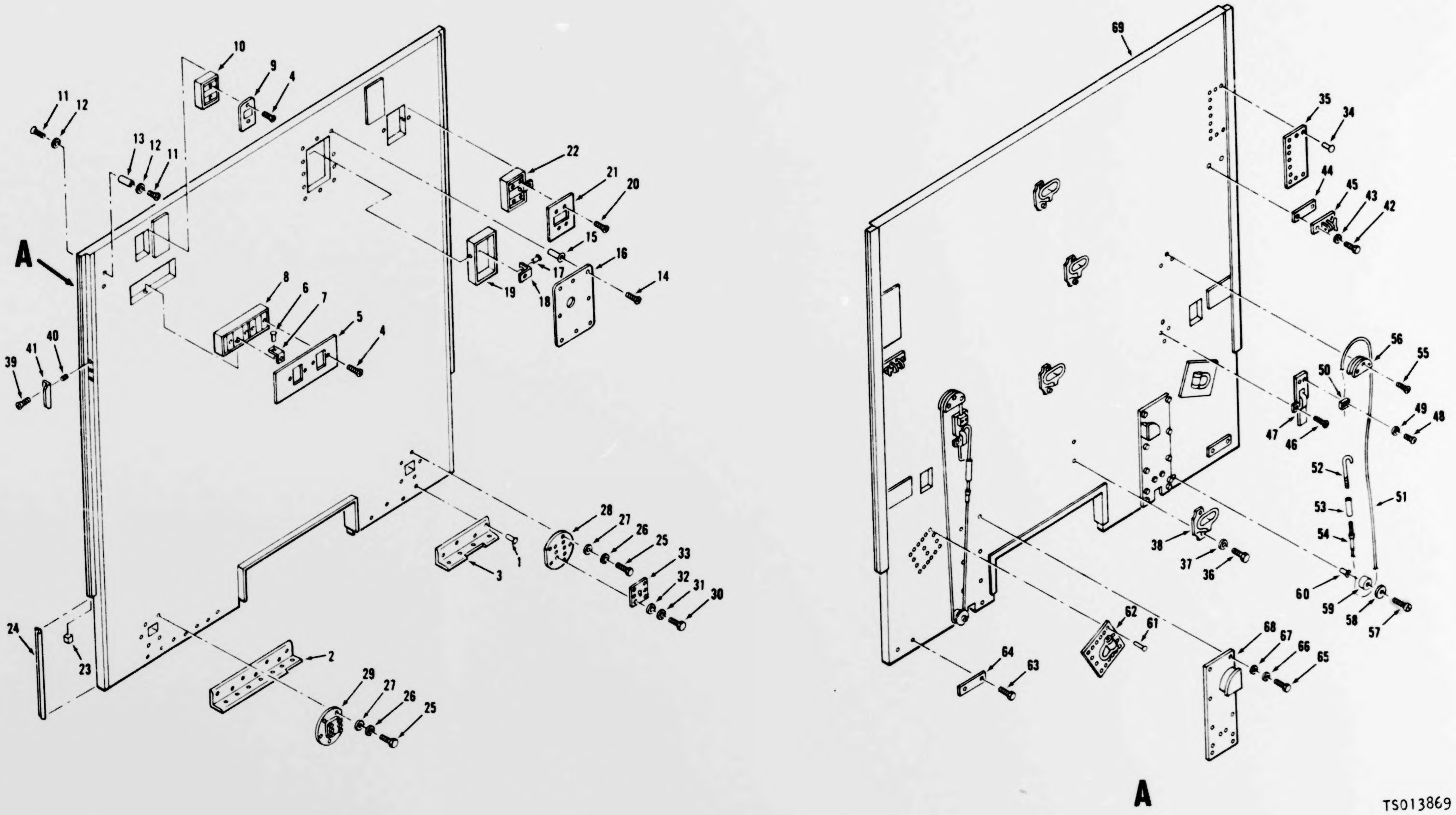
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TS013869

FO-7. *Fixed End Panel (Water Box) Assembly (TS 013869)*

1. Rivet (22)
2. Angle
3. Angle
4. Screw (6)
5. Cover
6. Rivet (2)
7. Angle, grounding
8. Box
9. Cover
10. Box
11. Screw (2)
12. Washer (2)
13. Ground rod
14. Screw (8)
15. Rivnut (8)
16. Cover
17. Rivet (2)
18. Angle, grounding
19. Box
20. Screw
21. Cover
22. Box
23. Seal
24. Seal
25. B.OLT (10)
26. Washer (10)
27. Washer (10)
28. Ring assembly, R.H.
29. Ring assembly, L.H.
30. Screw (6)
31. Washer (6)
32. Washer (6)
33. Fitting
34. Rivet (11)
35. Plate
36. Bolt (2)
37. Washer (2)
38. Step (4)
39. Screw (3)
40. Insert (3)
41. Striker plate
42. Bolt (2)
43. Washer (2)
44. Spacer (2)
45. Bracket (2)
46. Screw (4)
47. Latch assembly (2)
48. Screw (2)
49. Washer
50. Clamp assembly (2)
51. Cable assembly (2)
52. Hook (2)
53. Turnburckle (2)
54. Terminal (2)
55. Screw (3)
56. Capstan (2)
57. Screw
58. Washer
59. Spacer
60. Insert
61. Rivet (16)
62. Tiedown assembly (2)
63. Screw (2)
64. Spacer
65. Bolt
66. Washer (12)
67. Washer (12)
68. Guide assembly (2)
69. Panel, fixed end

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